Nature Magazine

MARCH
1958

VOLUME 51
NUMBER 3

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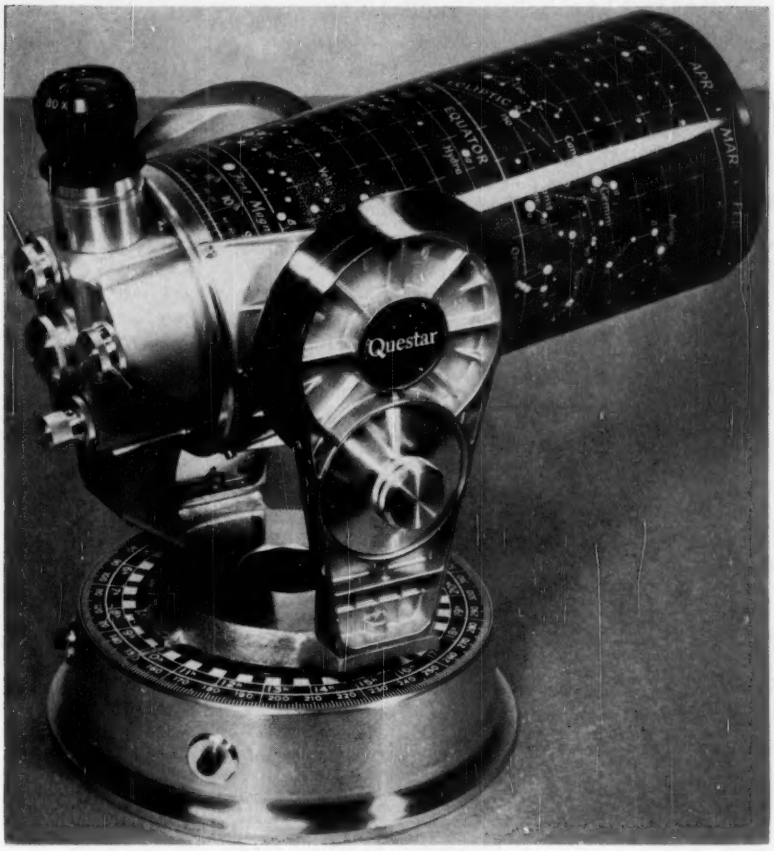

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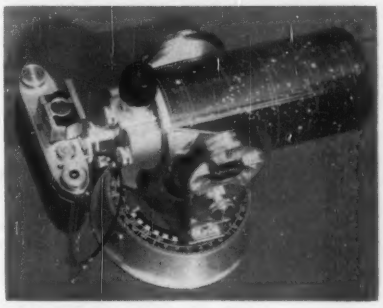

Nature Magazine

MARCH, 1958 VOL. 51 NO. 3

Published by the AMERICAN NATURE ASSOCIATION to stimulate public interest in every phase of nature and the out-of-doors, and devoted to the practical conservation of the great natural resources of America.

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SUBSCRIPTION RATE

NATURE MAGAZINE is published monthly, October to May, inclusive, bimonthly, June to September, inclusive, by the American Nature Association. Entered as second-class matter May 31, 1927, at the post office at Washington, D.C., U. S. A., and accepted for mailing purposes at the special flat rate of postage provided for in the United States Postal Act of October 3, 1917, and February 28, 1925. U.S. and Canada one year, $5; foreign, $.50 extra; two years, $9; life, $100.

Publication and Editorial Office, 1214 16th Street, N. W., Washington 6, D. C. Additional office of publication, Easton, Pa.

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Nature Magazine, past and present, is indexed in The Reader's Guide in your public library.

Reviews

Tunnel in the Desert

By William H. Carr. Tucson, Arizona, 1957. Arizona-Sonora Desert Museum, P.O. Box 5602, Tucson, Arizona. 34 pages. Illustrated. Sixty cents.

This is the second in the educational series published by the unique Arizona-Sonora Desert Museum near Tucson, and bears the sub-title "An Underground Venture in Education." In a foreword Joseph Wood Krutch points out that the objective of the Museum is to interpret and that, as far as possible, "it must also show *how* the plant or animal lives, and *why*, given the special conditions of the desert, it does so." Since many desert creatures spend the daylight hours below ground, the Museum was confronted with the difficult problem of showing how these animals actually live. The solution of this problem by creation of a tunnel in the desert justifies the use of the adjective "unique." In this booklet the founder and director emeritus of the Museum tells how the tunnel idea came into being, was translated into actuality, and what it shows of desert life.

Transactions of the 22nd North American Wildlife Conference

Edited by James B. Trefethen. Washington, D. C. 1957. Wildlife Management Institute. 682 pages. $3.00.

Annually the North American Wildlife Conference brings together conservationists for a three-day session devoted to conservation in its many aspects, but with principal emphasis on wildlife. There are general sessions and technical sessions, the latter providing an opportunity for discussion of field and other studies of wildlife techniques and practises. Each year the proceedings and papers are published by the Wildlife Management Institute, which sponsors the Conference. These annual volumes have notable reference value and importance as source material on conservation.

Briefly Noted

Practical Prospecting. By Barry Storm. Inyokern, Cal., Box 74. 1957. Storm Publishing Associates. 60 pages. Illustrated. $2.00. A booklet for prospectors, rock-hounds, outdoorsmen, vacationists and all who have fun mineralogically.

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THE MILWAUKEE ROAD

Nature IN PRINT

By HOWARD ZAHNISER

Reading and Reviewing

CLIFTON FADIMAN quotes Sydney Smith, a "nineteenth-century Anglican parson," one of Mr. Fadiman's chosen imaginary conversationalists, as saying "that he never read a book before reviewing it, because it prejudiced a man so." Although enjoying the humor of this remark, I surely find little to share in Sydney Smith's predilection. As for me, only the joy and satisfaction of the reading seem to warrant either the pains of reviewing or the dissatisfaction with that which materializes. Seldom have I allowed myself to be compelled into the composition of a review so long as I might continue the reading.

There are, however, occasions, in the midst of current circumstances of many obligations and activities, when extensive works to which and for which one wishes to call attention and express appreciation seem to call for a more or less timely discussion before they have been read in all fullness. The books that can thus endure partial reading before review are often works that also should encourage possession and occasional reading by general readers who might be tempted to consider them "too long" for their own busy lives. Such are the two collections of "papers" that I have before me now — both two-volume publications, both of uncommon reader interest, both deserving (in appropriate pages) thorough consideration and appraisal, and both much to be desired on the library shelves for time-to-time enjoyment and reference. Both are among those books with which one likes to live.

One of these is the compilation and editing by Edgar B. Nixon of letters and public papers entitled *Franklin D. Roosevelt & Conservation 1911-1945*. The other is *Louis Marshall: Champion of Liberty: Selected Papers and Addresses*, edited by Charles Reznikoff with an introduction by Oscar Handlin.

Conservation concern

Out of the latter volumes, with some 1200 pages, a chapter of 111 pages deals with Louis Marshall's concern with "Conservation," and elsewhere throughout the volumes there are revealed the qualities and endowments that made him such an effective conservationist.

The Roosevelt volumes are the first documentary publication of the Franklin D. Roosevelt Library. If the letters and papers of F.D.R. were to be published "on the same scale and in the same fashion as that now being followed in the case of the Jefferson papers, they would fill not less than 200 volumes," says Director Herman Kahn of the Library in a foreword to these volumes. Rather, the F.D.R. editors are dealing with "certain rich seams that can be extracted for publication immediately." Dr. Kahn suggests that the choice of conservation as the subject of the first publication was almost inevitable.

Great events

Historians who will have to deal in the future with the second quarter of the twentieth century will find themselves concerned with domestic and international events that seem now to have been of the first magnitude. Among the prominent domestic issues was conservation—prominent in a way that it had never been nationally since the prominence of its beginnings as a movement around Theodore Roosevelt, a generation earlier. Inheriting, as it were, the sense of the importance of conservation as a social force, F.D.R. was also skillful in his political application of practical programs. One can not escape the fact, however, that his great conservation force as a person and a leader came out of his own interest in Nature. His letters and papers during the crowded times of his presidencies reveal again and again the effective way in which those concerned with particular conservation issues were successful in arousing the personal interest of the President.

As Oscar Handlin writes in his introduction, it also was interest in Nature that drew Louis Marshall into the conservation movement. Benjamin Cardozo called Louis Marshall, on his seventieth birthday, "a great lawyer; a great champion of ordered liberty; a great leader of his people; a great lover of mankind." His papers and addresses show that he was indeed eminent in all these fields of activity, and clearly he was all these things actively and in the great New York metropolis. But he had an Adirondack home at Lower Saranac Lake also, obviously not a place of indolence but certainly a refuge. *He valued the outdoors so highly that he became a champion of its conservation.*

"As a lover of the woods, and one interested in the preservation of that wonderful forest which the State has set apart for all time, as a resort for health, rest, and recreation and as a reservoir for a water supply for future generations," Louis Marshall wrote the New York Forest, Fish and Game Commissioner in 1908, "I deem it my duty to call your attention to conditions which demand immediate remedy." He continued throughout his life to keep alive that sense of duty, which was given a vitality by his own enjoyment of natural surroundings. He walked. "He walked from two to five miles almost every day, and just a couple of months before he died, took a ten-mile walk in the Adirondacks." In New York City he walked in Central Park (and was a champion of its protection). When Henry Ford (from whom he received public retraction of articles in the *Dearborn Independent* attacking Jews) offered him "any of his products," Mr. Marshall "respectfully *declined*, informing him of my devotion to pedestrian locomotion," as he wrote in obviously good spirits to his son. He kept in touch with Nature and thus had a motivation in his own experience for his conservation contributions.

Enduring contribution

As an active chairman of the board of trustees of the New York State College of Forestry at Syracuse University, as an advisor to members of the United States Supreme Court and others when the protection of migratory birds was a constitutional issue, and in many other ways, but preeminently as a champion of New York's constitutional protection of its Adirondack and Catskill Forest Preserve, Mr. Marshall made an enduring contribution to conservation.

He was a member of both the 1894

and the subsequent 1915 constitutional conventions in New York City. In defending the forest preserve provisions of the constitution at the latter convention he said:

"If I were asked to state what the most important action of the convention of 1894 was, I should say without the slightest hesitation that it was the adoption of section 7 of Article VII of the Constitution which preserved in their wild state the Adirondack and Catskill forests. And if I were asked to state today the most important question which is to be acted upon by this Convention, I should say unhesitatingly that it is the section which we are now considering."

Louis Marshall's defense of this constitutional provision has certainly helped assure its continued effectiveness. It also, however, has been something of a national example and through Louis Marshall's sons—James, Robert, and George—this Adirondack influence has had a still wider and a direct influence on national conservation of such areas. "My children," Louis Marshall once wrote, "have imbibed the Adirondack spirit." Their conspicuous national contributions are a part of the Adirondack conservation achievement of their father.

Oscar Handlin, in his excellent introduction to these Marshall volumes, points out with acumen that:

"Our written history, which is largely the story of politics, has generally emphasized the role of the political leader and neglected that of men whose achievements—no less significant—were in some other area of social action."

Perhaps in these cursory comments on papers of the greatest political leader of our time and nation, along with the papers of one of its most brilliant and dedicated citizens, we may seem to be reversing this emphasis. If so it should be considered as only *pro tempore* and as corrective as to balance, for to all of us who lived in the conservation awareness of F.D.R.'s pre-war administrations these conservation papers are of intense interest. We shall write of them further—and also again of these Marshall papers. We can not delay longer letting the readers of these pages know of the interest of these books.

Franklin D. Roosevelt & Conservation 1911-1945. Compiled and edited by Edgar Nixon. Franklin D. Roosevelt Library. Hyde Park, N. Y.: 1957, xiv plus 614 + 700 pp., in 2 volumes, (6-1/8 by 9¼ in.), with frontispiece photograph of Franklin D. Roosevelt and Gifford Pinchot, foreword by Herman Kahn, director of the Franklin D. Roosevelt Library, introduction by the editor, and index. $9.50.

Louis Marshall: Champion of Liberty: Selected Papers and Addresses. Edited by Charles Reznikoff. The Jewish Publication Society of America: Philadelphia: 1957. xliii + 1196 pp. in 2 volumes (6¼ by 9½ in.) with frontispiece photograph in each volume, introduction by Oscar Handlin, chronology, and index. ❦ ❦ ❦

A Flora of the Marshes of California

By Herbert L. Mason. Berkeley, California. 1957. University of California Press. 878 pages. Illustrated. $10.00.

This distinguished botanical volume describes currently known species of both flowering plants and ferns indigenous to the habitat and region indicated by the title. Many plants significant as food for waterfowl are included. The text for this volume has been five years in preparation and covers an area of plant life that in the past has been largely ignored by botanists. There has been a recent growth in the importance of marsh plants and they have much bearing on waterfowl populations, and the depredations of the birds on farmer's crops when the needed natural food is unavailable. The presentation is for the systematic botanist rather than for popular use.

Insect Flight

By J. W. S. Pringle. New York. 1957. Cambridge University Press. 133 pages. $3.00.

Knowledge of the machinery of insect flight has increased in recent years, thanks to application of methods of experimental analysis. In this little monograph the author brings together the results of the latest investigations of the mechanics of wing motion, the structure and physiology of flight muscle, aerodynamics, sense organs and nervous coordination. The assembled information demonstrates how a common structural plan has been perfected during the course of evolution to produce the variety of form and function found in the different insect orders.

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AMONG MARCH'S AUTHORS

Maxwell Wheat

Peggy Larson

Maxwell C. Wheat, Jr., assistant editor of Motor Boating Magazine and all-round outdoor enthusiast with a special interest in bird life, lives in Hollis, New York; he is president of the Brooklyn Bird Club, and is a week-end "regular" on the beach and in the woods in pursuit of his studies. . .Peggy Larson is the wife of the curator of exhibits at the Arizona-Sonora Desert Museum, in Tucson, Arizona, a photographer and writer of articles with a Nature interest. . .Robert C. Baur is a long-time resident of Norwalk, Connecticut, a free-lance writer with a hobby of gardening and a firm conviction that "sputniks may come and go, but the hepaticas will bud and the robins return as usual". . .Alice L. Hopf, of New York City, a member of the New York Entomological Society and the Lepidopterists' Society, was led into a specialty of breeding lepidoptera after deciding that catching butterflies would be a good summer diversion for her seven-year-old son. . .Charles Morrow Wilson, a Vermonter with a deep interest in conservation and a free-lance writer on its various aspects, divides his time between Brattleboro and an old farm in the nearby town of Putney. . .Alden S. Wood, no stranger to the pages of Nature Magazine, edits a house magazine for the New England Mutual Life Insurance Company in Boston, Massachusetts, and also finds time to do free-lance writing. . .Patricia M. Miller and her husband are missionaries in the Arctic village of Noorvik, Alaska (population 300, mostly Eskimo), who, as amateurs in the field of Nature study, kept notes on the rearing of a rather unusual pet and gathered them into a little story. . . Dorothy R. Schneider is an article writer and housewife of Monson, Massachusetts, who has a keen desire to bring her family up in close touch with the out-of-doors.

A Nature Bargain

An associate membership in the Natural History Society of Minnesota is one of the best bargains we have encountered for a long time. It did not take us long to arrive at that conclusion after receipt of a copy of Volume Eight, Number Two of the *Minnesota Naturalist*, a special issue devoted to the Grand Teton-Jackson Hole Country.

The Natural History Society was organized eight years ago and has grown to some 2000 active members and several thousand associate members. The publication began as a small mimeographed offering, but with the issue mentioned above blossoms into a beautiful 92-page, 8½ by 11-inch magazine, illustrated in color and black and white. Contributors include Olaus Murie, Lee and Florence Jaques, John and Frank Craighead, Leslie Kouba, Conrad Wirth and others, in this instance those intimately acquainted with the Teton country.

Editor of this quarterly is Clayton G. Rudd, and he has done a splendid job. His editorial council is made up of Harvey L. Gunderson, Forrest B. Lee, Grace Lee Nute, Orwin A. Rustad and Dana Struthers. We understand that the four issues planned for 1958 are a spring issue dealing with waterfowl and migration; a summer issue treating with Glacier National Park; a fall issue devoted to the Minnesota-Canadian Borderland; a winter issue to be titled Winter in the North Country.

The bargain arises from the fact that a three-dollar associate membership includes all four issues for a year. Individual issues cost at least a dollar (the Teton-Jackson Hole issue is two dollars and is certainly worth it). Headquarters of the Society and the editorial offices are at 315 Medical Arts Building, Minneapolis 2, Minnesota.

Wildlife Conference

The Jefferson Hotel in St. Louis, Missouri, will be the focal point this year for conservation leaders, fish and game biologists, outdoor writers and outdoor enthusiasts in general who plan to attend the Twenty-third North American Wildlife Conference, March 3, 4, and 5. Held each year in a major American city under the sponsorship of the Wildlife Management Institute of Washington, D. C., this year's conference will consist of three general and six technical sessions, all open to the public.

The opening session, March 3, will have as a theme for discussion "Today's Opportunities for Conservation," under the chairmanship of Delyte W. Morris, president of Southern Illinois University, who will be assisted by Monroe Bush of the Cld Dominion Foundation. Irving Feist, a national trustee for Ducks Unlimited, and his assistant, N. Wayne Pritchard, executive secretary of the Soil Conservation Society of America, will be in charge of the second general session, with a theme of "Youth and Our Natural Resources;" while Arthur H. Carhart, conservation writer of Denver, Colorado, will be chairman of the closing general session, assisted by Frank Gregg, executive director of the Izaak Walton League of America. The topic for the third session will be "The Fight for Conservation."

Bulletins

"Land Utilization in the United States" is a series of six papers dealing with the problem of land utilization in this country, reprinted together in large brochure format. The authors, all members of the Soil Conservation Society of America, deal with problems such as the diversion of agricultural land for highways and urban development, wildlife management, land inventories, and the general need for conservation. Thirty-two pages, well illustrated. Published by the Soil Conservation Society of America, 838 Fifth Avenue, Des Moines 14, Iowa, and priced at fifty cents.

"Man as a Maker of New Plants and New Plant Communities" and "A Narrative of the Smithsonian-Bredin Caribbean Expedition, 1956" are Smithsonian Institution publications 4286 and 4285, respectively. The first, by Edgar Anderson, tells something about how man has changed the face of the world, plant-wise—although perhaps in many cases without realizing the fact. The second, by Waldo L. Schmitt, is an account of the Smithsonian-Bredin expedition into the Caribbean, that "happy and fruitful hunting ground for the naturalist." From the Director of Publications of the Smithsonian Institution, Washington 25, D. C.

"Research Report No. 1" and "Research Report No. 2," both by George R. Lamb, are publications of the Pan-American Section of the International Committee for Bird Preservation, New York City. The first describes the Cuban ivory-billed woodpecker and efforts that are being made to prevent it from sharing the fate of the American ivory-bill. Publication No. 2 deals with species of birds in the United States Virgin Islands—St. Croix, St. John, St. Thomas and nearby cays—whose future is in doubt because of nest robbing and shooting, in breeding colonies.

Contents noted BY THE EDITOR

VIRGINIA CAN POINT WITH PRIDE to many things, but not to Route 1 between Richmond and Washington, D. C. This highway is rapidly forging into first position as the most dangerous highway in the country, especially at night. Most recent lethal additions are more than one hundred signs advertising a new and luxurious motor hotel near the Capital. Many of these signs are large black affairs, with a great luminous arrow that leaps out at the motorist, and so much reading matter that they are particularly dangerous. One sign advertising this hostelry is a large illuminated affair placed close to the highway on the left, at the top of a hill and on a curve. A similar sign, similarly placed, invites one to patronize a Washington hotel. Both billboards are of the sort that can easily detour prospective customers to hospital or morgue. And both these last-mentioned billboards are erected by a member company of the Outdoor Advertising Association of America, whose members ostensibly subscribe to a set of "standards!" Probably the only antidote for Route 1 is a new express-highway in the Interstate System, the environment of which, it is to be hoped, will be protected by action of the 85th Congress.

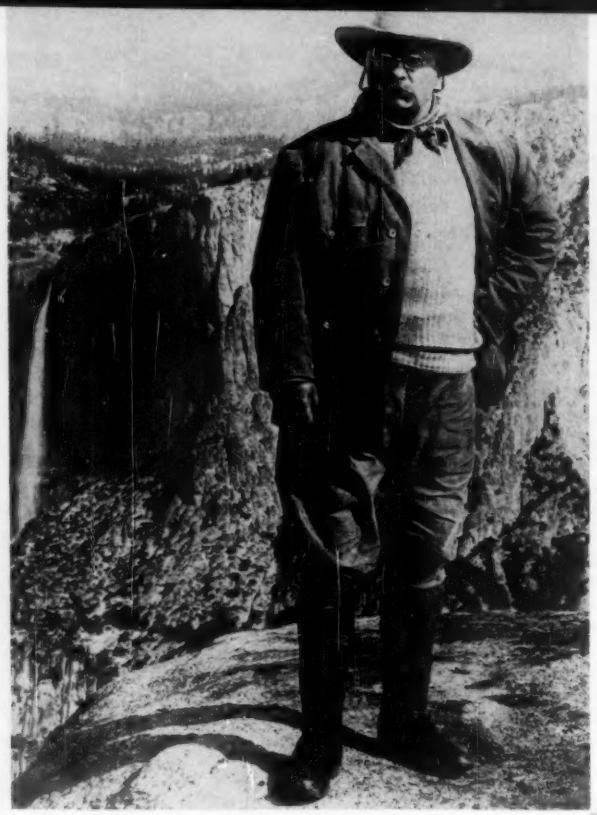
[*Editor's Note:* Four days after the above was written and sent to the printer three people were killed and eight others were seriously injured in accidents on one of the signboarded curves on Route 1. In one of the accidents a billboard post sheared off the top of an automobile, killing three occupants. Many of the billboards on this highway are perilously close to the right-of-way. No, Virginia cannot point with pride to Route 1!]

SEVERAL IMPORTANT CONSERVATION ISSUES are pending before the second session of the 85th Congress and conservationists generally are united in support of affirmative action. These measures include requirement of the observance of conservation laws on military reservations; strengthening of the Coordination Act; increase in the Duck Stamp price to three dollars, with funds earmarked for acquisition of wetlands as waterfowl habitat. Bills seeking the establishment of a national system of wilderness areas were given hearings at the first session of the Congress and now await action. Bills to authorize research into the effect of chemical pesticides on wildlife (see editorial next issue) are important, as is the bill (S.846) to conduct an outdoor recreation resources review. Legislation to control outdoor advertising along the new Federal Interstate Highway System has drawn widespread support.

"THE EXPLODING METROPOLIS" is the title of a series of significant articles in *Fortune*. The fifth in the series is by William H. Whyte, Jr., and is entitled "Urban Sprawl." The basic theme is: "The countryside of today is the suburbia of tomorrow—and we are ruining it even before the suburbanites get there." Mr. Whyte treats with the vital importance of making provisions for open space before it is gone and it is too late or too expensive to reclaim it. "Already," the writer says, "huge patches of once green countryside have been turned into vast smog-filled deserts that are neither city, suburb, nor country. . .much more of this kind of progress and we shall have the paradox of prosperity lowering our real standard of living." Mr. Whyte also significantly observes: "It takes remarkably little blight to color a whole area; let the reader travel along a stretch of road he is fond of, and he will notice how a small portion of open land has given amenity to the area. But it takes only a few badly designed developments or billboards or hot dog stands to ruin it, and though only a little bit of the land is used the place will *look* filled up." This article and its companion pieces deserve serious consideration and action.

A HUMANE CLAUSE IN THE LAW OF THE SEA is the goal of humanitarians and conservationists. Cruelty and waste of biological resources are involved in the processes used in killing such pelagic creatures as whales and seals. All this goes on far from the general view. The National Humane Education Society, under the chairmanship of Alice Morgan Wright, is urging a humane Article that will require humane methods in killing the living creatures of the sea, whenever such methods are developed to a practical state. Also it is urged that the Secretary-General of the United Nations shall appoint a permanent commission of three or more members to determine what methods are humane and practical.

FOUR NATIONAL WATERSHED CONGRESSES have been held and one of their many important by-products is represented by the printed proceedings of each of the four Congresses. These publications provide splendid reference material on this important phase of conservation. Copies of these publications should be on the shelves of every library that attempts to be well equipped in the area of conservation literature. We are advised that a limited number of copies of the proceedings of 1954, 1955, 1956 and 1957 are available at three dollars each. John H. Jones, a member of the program committee of the annual Congress, has them in charge, and his address is P.O. Box 1062, Fairmont, West Virginia. The Watershed Congress is sponsored by more than twenty organizations in the national farm, industrial, civic and conservation fields, and will hold its 1958 meeting in Dallas, Texas. R.W.W.



Bull Moose of Conservation

The year 1958 is the anniversary of the birth of Theodore Roosevelt, dynamic leader of the conservation movement in the early part of the twentieth century. Here President Roosevelt is pictured in California's Yosemite in April, 1903.

PHOTOGRAPH COURTESY
HARVARD COLLEGE LIBRARY

H. K. JOB

The President was an enthusiastic bird watcher, and worked vigorously to protect endangered species.

THE PHOTOGRAPHS of treeless, sand-covered Asian wastelands that President Theodore Roosevelt attached to his State of the Union message, in 1908, might have seemed, at the time, irrelevant. But Theodore Roosevelt, in his characteristically forceful manner, soon made it clear to the assembled senators and representatives that these pictures were much concerned with the "state of the union;" that if the members of the Congress bowed to the pressure of commercial interests that wanted the nation's natural resources opened wide to them, similar pictures some day might be labeled "Made in USA!"

Today, a half-century later, when America observes the one-hundredth anniversary of Theodore Roosevelt's birth—he was born October 27, 1858, in New York City—such photographs can be taken in many parts of the United States, photographs showing dismal, deforested areas, and lands and communities drowned by rampaging waters loosed by the destruction of forest cover by man or fire.

But, thanks to the amazing energy of the twenty-sixth President, the "amber waves of grain" and "purple mountain majesties" sung about in *America, the Beautiful* are still realities—although, in some cases, perhaps rather tarnished since Roosevelt's time.

Indeed, it seems a miracle that when the threat of exploitation was at a new peak, when our natural resources were largely unprotected by law, when the conservation forces most needed the solidifying influence of a strong leader, the man who most effectively could lead the fight occupied the most powerful office in the land—the Presidency.

It was not so much that Roosevelt originated the measures; most of them, in fact, had already been stirring in the minds of men who needed only the power to implement them. And T. R. gave the men the power by making some of them important members of his administration; notably Frederick Newell, founder of the Reclamation Service, and Gifford Pinchot, founder of the Forest Service.

What had been only a trickle of success, before Theodore Roosevelt took office, swelled into a torrent of progress during the nearly eight years of his administration. Where there had been only some 20,000 acres under irrigation, there were, through the Reclamation Service, 3,000,000 by 1908. Under the Forest Service Act of 1891, timberlands totalling 50,000,000 acres had been set aside by predecessors; Roosevelt added another 150 million acres. He doubled the number of national parks to a total of ten, and under an act passed in 1906, he established sixteen national monuments. He created, also, fifty-one Federal wildlife refuges, the first being Pelican Island, in Florida, which had been a mecca for the plume hunters that had been reducing our egret population nearly to the point of extinction.

By MAXWELL C. WHEAT, JR.

Colonel and Mrs. Roosevelt, with Archie between them in the background, are returning to their home, Sagamore Hill on Long Island, after a boat ride, June 25, 1914.

COURTESY AMERICAN MUSEUM NATURAL HISTORY

President Roosevelt unearths the egg deposit of a great sea turtle.

COURTESY AMERICAN MUSEUM NATURAL HISTORY

So much was being done, in fact, that a simple, all-inclusive label was needed to denote the whole effort. A discussion of one problem invariably brought in some other phase—forests, lands, waters, minerals, or animals. They all seemed interrelated; at least, this was the thinking of Chief Forester Gifford Pinchot.

Besides, Pinchot's Forest Service was stepping up its output of educational material. Call it propaganda, if you will, it all had the effect of alerting the public to the need for the safeguarding of natural resources. The Service, in 1901, had published three bulletins. In 1907, it published sixty-one, and the copies of these, and other materials, ran into the millions.

Pinchot wanted to coin a catchy word for the effort, one that would become a part of the public vocabulary. After conferring with his colleagues, a term was evolved from the word "conservancies,"—the name by which the government forest lands in India were known.

One day, as the President and his chief forester were riding their horses across the Washington countryside, Pinchot suggested the new name to Roosevelt. A passerby might have heard the air ring with the shout of "bully," and soon an effort was launched to make all America familiar with the word "conservation."

All conservation efforts, from the saving of a diminishing wildlife population to the setting aside of desert lands for irrigation, now began to march under a single banner, and the movement soon evolved into a more integrated national response to the threat of uncontrolled exploitation. This was reflected in a growing feeling that a national meeting of some kind would now be appropriate. So, at President Roosevelt's invitation, the State governors (there were forty-six States, then) met together in the White House, along with experts and government officials, to discuss conservation.

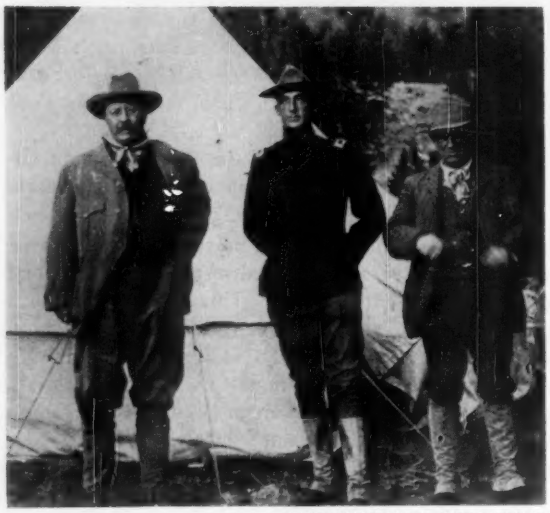
Never before had all the governors of the United States been asked to confer together on a common problem, and all accepted. As a side result, the governors have continued such joint meetings, and the fiftieth gathering will take place this year. What could be a more appro-

This photograph of President Roosevelt, standing in front of a huge sequoia in Yosemite National Park, was taken in May, 1903. Standing just to the left of the President is John Muir.

COURTESY HARVARD COLLEGE LIBRARY

On March 18, 1911, Theodore Roosevelt formally dedicated the Roosevelt Dam, on the Salt River, in Arizona, work on which had been completed in 1910.

COURTESY THEODORE ROOSEVELT ASS'N.



COURTESY HARVARD COLLEGE LIBRARY

Theodore Roosevelt is shown here during a visit to Yellowstone National Park in April, 1903. Standing beside the President is Major Pitcher, superintendent of the Park.

priate topic for this year's Governor's Conference than conservation, particularly in light of the wilderness preservation bill that is now pending before Congress?

The immediate impact of the conference, publicity-wise, left on the public mind a permanent impression that closely identified Theodore Roosevelt's administration with conservation. And the tangible results of succeeding years support the claim that Roosevelt should be as well known for his conservation efforts as for his trust-busting. Indeed, in their book, *The Growth of the American Republic*, published in 1940, the authors, S. E. Morrison and Henry S. Commager, declared that conservation was "unquestionably the most important achievement" of Theodore Roosevelt's administration.

The effect of the first governors' meeting was felt across the land, and even beyond our borders. Forty governors, following a conference recommendation, appointed State conservation commissions. Implementing another recommendation, Roosevelt appointed a National Conservation Commission to take an inventory of the country's resources, and to work with the State commissions.

With the success of the Governor's Conference in mind, President Roosevelt approved the idea of a North America Conservation Conference, and later in 1908, after Pinchot had delivered personal invitations to their governments, Canada, Mexico, and Newfoundland sent representatives to meet in Washington. These participants, in turn, urged the President to convene a world-wide conference. In the remaining days of his administration, Roosevelt worked eagerly to get the machinery going. Invitations were sent to fifty-eight nations to meet at The Hague, Netherlands, and thirty of them had accepted when President Roosevelt's successor, William Howard Taft, put an end to the plan.

It seems a fortunate thing that, at a critical time, conservation found not only a strong spokesman in the nation's President, but also a man who seemed to know as much about the many problems, if not more, than the experts he gathered into his administration. As the poet, John Burroughs, said: "The President is a born nature-lover, and he has what does not always go with this passion—remarkable powers of observation."

Roosevelt was an authority on the short-tailed shrew, having written a paper on this small mammal, and he had even carried on a correspondence about the shrew with the chief of the United States Bureau of Biological Survey. Once, when shown the statue of an elephant by a famous French sculptor, President Roosevelt quickly detected an error. The artist had portrayed the animal running like a horse—a hind and a front foot on opposite sides moving together. Roosevelt knew that the elephant was a pacer, and that both legs on the same side should have been moving together!

There was a tradition among Washington newspapermen that a Cape May warbler once broke up a cabinet meeting. It may well have been true, for the President was quite familiar with the birds frequenting the White House trees and lawns. Before he left the Presidency, he submitted a list to a local ornithologist, noting ninety-three birds seen in the vicinity of Washington, fifty-seven of which he had seen around the White House. Indeed, people looking through the fence during a spring "wave day" could see two figures—man and wife—hustling about, and peering upwards into the tree tops.

As a youngster, Roosevelt had turned to the outdoors to find the strength that had passed him by at birth, and perhaps he instinctively appreciated that which could be drawn by the nation from its wilderness. While the boy was filling out his spindly legs and arms picking apples, building wigwams, hunting frogs, and collecting curios for the Roosevelt Museum of Natural History (relocated by unanimous family consent from his room to an upstairs back hallway), a war-sick nation was turning to the seemingly limitless resources of the West. From these the country was to draw the strength that would eventually make it the leading power of the world. It was a turn of events in which Theodore Roosevelt, as President, was to play an important role.

Confederate gray and Yankee blue had been put aside for the plainer garb of the wilderness conqueror, and the guns that had been pointed across the Mason-Dixon line were now being used to push the Indian farther into the wild country. The axe, also, had become as important as the rifle. With each tree that crashed to the ground, America felt more confident.

More and more people heeded the cry, "Go West, young man." Hundreds of thousands of adventurers, speculators, dreamers and home-seekers responded. Finally, the wilderness clearers could look back on the brown skin of the unclothed land, and see America flex its new muscles represented by towns and cities. But much had been left bare.

The once-sickly boy, who had become strong through his self-imposed physical exercises in the open, could only shout, at first, "deee—lighted," at the vigorous Western exercise that seemed to make America strong and healthy. And he, too, went West, not to pioneer, but to become a "rough rider" with the rest of the cowboys. He now could cast a critical eye on a fellow easterner, and write that "to compete with these men, he must not only be naturally well-fitted for life, but he must spend at least two years in downright hard drudgery learning the business."

Roosevelt put in those two years, and more. He invested in a ranch. He made several trips West, in subsequent years, and all this gave him a knowledge of western problems that was to prove valuable in his later conservation efforts. The naturalist in Roosevelt had seen that the nation was not really adding to its strength; it was pulling its strength out by the roots, and it was not putting anything back.

Even while in pursuit of the buffalo, Theodore Roosevelt was appalled at the sight of the gleaming white buffalo skulls that littered the prairies—grim reminders of wanton slaughter—and the fact "that the sudden and complete extermination of the vast herds of buffalo is without a parallel in modern times." (Later, as President, Roosevelt was to lend the prestige of his high office to the efforts of the American Bison Society, dedicated to the preservation of the rapidly decreasing buffalo herds. He became honorary president of the Society).

When Theodore Roosevelt returned East, he organized many of his fellow hunters into an organization devoted to the preservation of "big game." He named the organization the Boone and Crockett Club, a memorial to two of his heroes. Although these two were among the leaders of the tree-chopping wilderness conquerors, his admiration for them was a clue to the character of the future President, and to the times in which

President Roosevelt at Gardner, Montana, probably at the time of the laying of the cornerstone of the gateway to Yellowstone National Park in 1903.

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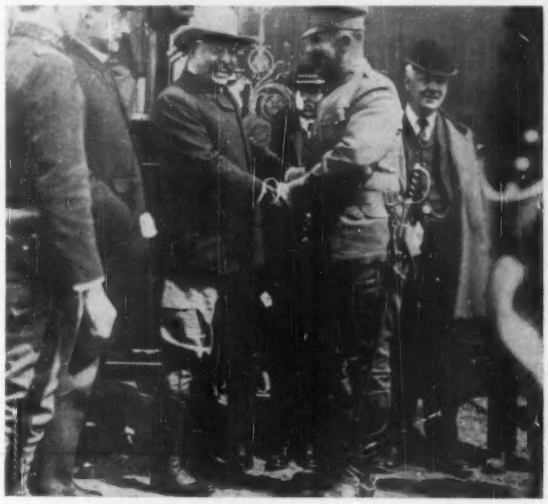

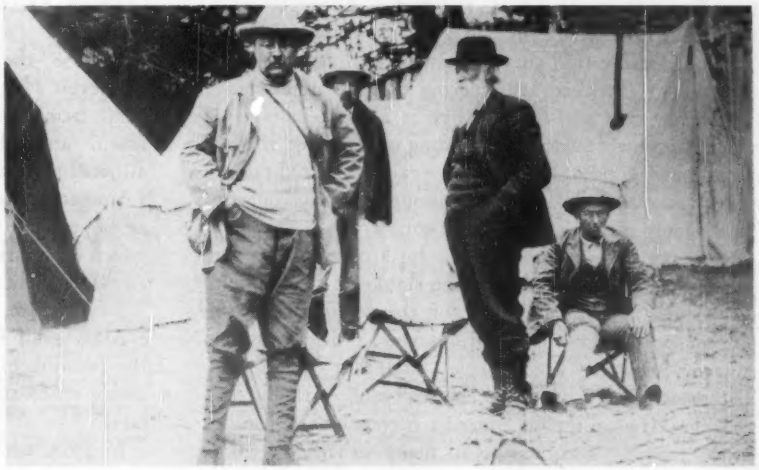

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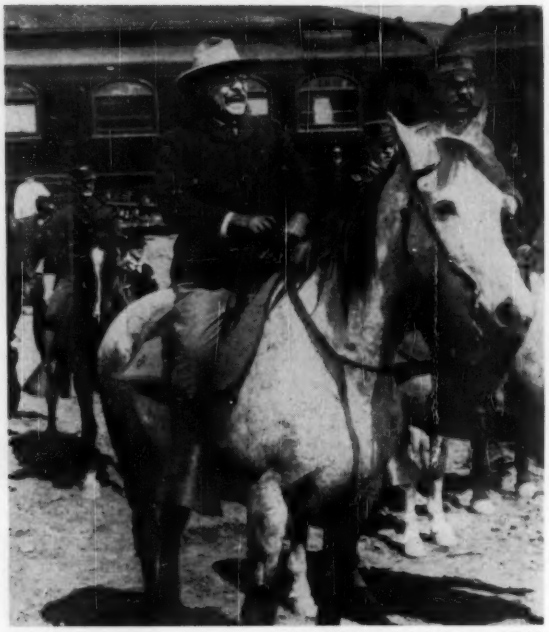
This photograph, taken in Yellowstone National Park, shows the twenty-sixth President with naturalist John Burroughs (standing at the right).



COURTESY HARVARD COLLEGE LIBRARY

The famous Theodore Roosevelt smile is prominent in this photograph, taken at Yellowstone National Park.

he lived. For America, a young and growing country, needed its heroes. And, besides, "Roosevelt had a good deal of the boy in him." These were the words of John Burroughs, who was also a Roosevelt hero, although a contemporary one. Burroughs added, "I suppose it is that that makes him like me. . ." It was the boy who liked to collect things for his upstairs museum. It was the boy in the young man who loved to hunt the grizzly with the cowboys. It was the boy in the President who sent the great new fleet, for which he had been largely responsible, around the world, to show a young nation's newly acquired might—"Speak softly and carry a big stick!"

Such a philosophy was not likely to appeal strongly to those influenced by the Nature writings of people like Emerson or Thoreau; the latter, Roosevelt said, had never influenced him. In T. R.'s own writings you have the feeling that they are always rolling in on you, like heavy breakers thundering against the rocks. Sometimes this surf-like quality is a little calmer, as when Roosevelt reflects on the song of the wood thrush, or talks of a ride alone on the prairie. But there are never the quiet, still pools of thought, where one can look deeply into the man's philosophy.

However, it was not the time for a quiet man. The period was one of ferment. The smoke of the campfire was being lost in the smog of the factory, and the jagged spears of rising buildings were obliterating the rugged horizons of "purple mountain majesties." Roosevelt knew how to use the steel stuff of the factory and the city to thrust America forward as a leading world power. But, unlike so many others, he knew that the iron-appearing strength was partly just that—appearance. He knew that the real source of the nation's strength lay in the earth and that that was in danger. It was not so much a time for deep thought, as it was a time for decisive action. It was the time for the "Bull Moose!"

"I am a bull moose," Theodore Roosevelt said. But, in spite of the head down, feet-flying connotation of the words, the bull moose does not crash through the woods blindly. Conservation not only had a militant leader and an informed spokesman, but also it had a strategist, politically speaking. Despite the newspaper caricatures of "Teddy" Roosevelt, he surveyed the political scene carefully, and when he was ready, he acted.

As Governor of New York State, Roosevelt cleaned out the politically stacked Forest, Fish and Game Commission, and appointed qualified persons; and yet most of them had the backing of the political bosses. Roosevelt pointed out, candidly, that "I chose the men the way I did because my business was to improve the Commission. . . To have chosen them without preference to political considerations would have been amusing, or in other words a ridiculous and wholly useless piece of gymnastics."

If he could not persuade the politicians, the President knew how to get around them. In 1907, a group of special-interest senators moved to block the establishment of further reserves in the Northwest under the Forest Reserve Act of 1891. They attached a rider to an important agricultural bill, forbidding Roosevelt to set aside any more reserves in the northwestern States. They knew that the President could not afford to veto the whole bill, because such an action would hinder both the Agriculture Department and the Forest Service.

But the President was one step ahead. He knew that Chief Forester Pinchot had studied the western forests to ascertain what areas should be set aside. Pinchot was ordered to present his recommendations to the President. Immediately, on their receipt, Roosevelt signed the authorizing papers, beating, by two days, the deadline for signing the Agricultural Appropriations Bill. The unsuspecting senators had succeeded in hurrying the addition of sixteen million acres into the National Forest system.

In 1958, the one-hundredth anniversary of Theodore Roosevelt's birth, the basic issues are unchanged. The commercial interests, for example, are still ready to assault areas that demand, in the public interest, to be allowed to remain unspoiled. The fact that the conservation forces are usually strong enough to thwart such attempts may well be attributed to the seeds sown between the years 1901 and 1908 and nurtured by a growing army of tillers in the soil of conservation.

Everywhere, today, the bulldozer is a common sight, erasing small marshes, or smashing great forests. And the pressure of more and more people demanding both living space and playing space often beclouds the vital facts.

In 1958, conservationists are (*continued on page 164*)

The fierce struggle with the paper has been won, and the king regally surveys the damage. This was great sport for Whiskers, who, of course, took no part in cleaning up the thousands of paper fragments strewn from one end of the house to the other.

Whiskers

By PEGGY PICKERING LARSON

Photographs by the Author

If Nature had taken her usual course, Whiskers probably would not have been equal to survival in the desert, where he was born. But then, we did not know this until much later, and, of course, it was a case of love at first sight.

Looking back on our experiences with Whiskers, and other animals, we have come to the conclusion that wild animals have distinct personalities. It is not in the nature of most to become really tame, but sometimes there is an exception. Whiskers was one of those exceptions.

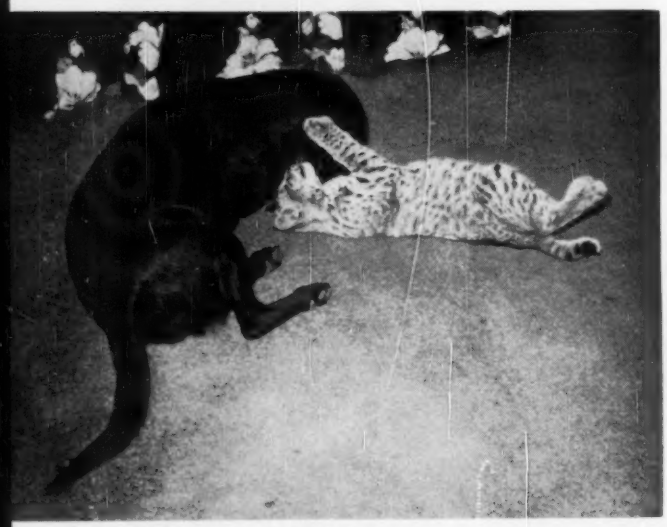
Whiskers was a bobcat, or wildcat; but when we first saw him, he looked anything but wild. He was so small—weighing not more than a pound—that he could easily fit in the palm of my hand; and he was very badly in need of a loving, rough mother's tongue to clean his woolly fur. In appearance, he was a mottled sandy color, with faint black stripes, and with black spots on a white stomach. The two tiny, blue eyes were barely open. Sticking out of the ball of fur were two minuscule ears that sported faint black and white stripes on their back sides.

A man had found the kitten in a sheltered place in the desert. He had taken the baby home with him; but, as often happens, learned within twenty-four hours that motherhood—even bobcat motherhood—can be an exhausting business. My husband works for the Arizona-Sonora Desert Museum, which displays a great number of living animals, and so it came about that we were elected to inherit the orphan.

Within a day, Whiskers was joined at our house by Buttons, his brother. Taken by another man from the desert nursery at the same time, Buttons also had convinced his captors that raising a young wild animal is not always an easy task.

Their tummies constantly bulged with milk, taken first from a doll bottle and, later, from a baby bottle. In a nest warmed by a light bulb and a hot water bottle, the kittens settled down at our house to a routine of sleep much and, especially during the night, eat often.

Humans are not to be judges of what members of the cat family should like or dislike. Whiskers loved to take his nap in this rather remarkable position.



Whiskers and Sally, the dog, would engage in joint mauling sessions, during which the cat would make repeated lunges at Sally's tail or ears.

Whiskers and Buttons grew fat and happy on their diet.

As their size and strength increased, they learned to cry to get out of their box. Once released, their one thought was to follow the feet of anyone venturing within their nearsighted vision. I spent what seemed like many hours carefully pacing the living room floor with the two orphans staggering, falling on their noses, and staggering again alongside me.

Even while they were so young, I believe we unconsciously favored Whiskers. Perhaps it was because he was smaller, and less aggressive; we felt sorry for him, because Buttons, missing his mother, liked to suck on poor Whisker's ears. Maybe, even that early, Whiskers seemed to be a more affectionate pet than Buttons.

It was impossible to feed one kitten at a time. If a hungry kitten—and they were always hungry—had to stand by, and watch his brother gulping, slobbering and sucking on a delicious bottle of milk, there was sure to be a kitten-tussle, and hurt feelings. The only solution was two bottles, one in each of my hands, with the business end of each bottle in the mouth of a greedy kitten.

Their first taste of fresh meat came when they were still quite small. If they had been with their mother, no doubt she would have been introducing them to such bobcat delicacies as rabbits and mice at about this time of their careers. Being an unversed substitute for their mother, I had no better sense than to give them each a piece of tough, raw chicken gizzard, to see if they were interested in the smell. Their reactions were instantaneous. Snarling, chomping, and nearly choking to death on the tough meat, they showed every indication of being wild animals. Not a morsel of meat was left, when they had finished. From that time on, the bottle held little interest for them. Fresh meat they demanded, and fresh meat they received.

Soon, they had the run of the house; but nothing was sacred. Dinner guests, who failed to heed our warnings about the "cute little darlings," often headed for home with our most humble apologies, and exceedingly damp clothing. When the cats were older, their favorite occupation—when we were not at home to stop them—was to get a roll of tissue paper from the bathroom, and battle it until it was completely subdued. By this, I mean that the paper was in possibly five million fragments, and strewn from one end of the house to the other.

Bobcats, in the wild, do most of their hunting at night, and often cover twenty to twenty-five miles during a night's hunt. Thus it was that Whiskers and Buttons were in top form, when we humans were at our lowest ebb, in the middle of the night. Nights in the desert, that summer, were hot; and we found it necessary to sleep with our bedroom door open, to get a breeze from the cooler. Despite the countless times it happened, it was always a shock for us to be rudely awakened in the middle of the night by the racing up and down, over, and around us and our beds, by what seemed to be a herd of elephants. In reality, it was a pair of tumbling, happily snarling, half-grown wildcats.

As they grew larger, we understandably became more anxious to teach them the wonders of a sand box. Buttons having been remiss in this matter one day, my husband gave him a light swat with his hand. It was the first human violence that had ever been directed toward him, and he taught us a lesson we have never forgotten. Wild animals, although they may appear to be tame, differ from most domestic animals, who easily understand corrective punishment. Violence directed against Buttons was something that his wild nature could not understand, and he immediately turned upon something more his size. Buttons struck out against Whiskers. A violent fight erupted, but Whiskers was no match for his larger brother. By the time we separated them, Whiskers was badly hurt.

On succeeding days, we attempted to reunite them; but each time, Buttons tried to attack Whiskers. Knowing that the cats' playful, romping days together were over, we gave Buttons to a friend. The cat quickly adjusted to his new home in the mountains, and lives there yet, in a semi-tame state and with a fox for company.

Whiskers recovered from the fight, and became fast friends with our large dog, Sally. She was lazy, and the cat was not. Whiskers made life miserable for Sally, attempting to play with her. Bouncing like a rubber ball around the dozing dog, Whiskers would make repeated lunges for Sally's tail or ears, with great evidence of delight. Sally stood for a certain amount of this, and at times grumpily enjoyed the cat's company. Their play periods were often followed by periods of snoozing, cuddled up against each other. This was more like Sally's cup of tea.

By this time, Whiskers was about nine months old, and weighed about twelve pounds. His fur was reddish brown, with irregular black stripes. His stomach had remained a pure white, with black spots. The back sides of his ears now were outstandingly marked with black and white stripes. He was easily distinguished from an ordinary cat by the tufts of long hair along his chin that gave him the rather elegant bewhiskered appearance from which he got his name. Also, his tail was no more than four inches long, with a black tip on the upper side.

The black color on only the upper part of the tail is one of the distinguishing characteristics between a bobcat and a lynx; the tip of the tail of the lynx is completely black. These two animals are often confused, and the name lynx is sometimes incorrectly used in referring to a bobcat. Actually, the lynx is found primarily in Alaska and Canada, while bobcats are found through most of the United States, and parts of northern Mexico. The ranges of the two animals overlap only to a small extent in the northern United States and southern Canada. The two types of cats are of the same genus, but of different species—the lynx being *Lynx canadensis*, and the bobcat being *L. rufus*.

Bobcats are found in a variety of environments, from mountains to desert. When grown, they may weigh up to thirty pounds, and are capable of killing fawns, or even larger deer when they are impeded by snow or illness. One bobcat pet with which I am familiar was banished to a zoo, after he killed a police dog in a fight.

Whiskers, though, did not know how others of his kind lived. He was strictly a house pet; and, as such, needed a sand box. His sand box was under our kitchen table. This was purely by choice—his, not ours. We tried moving the box, but learned, to our dismay, that he was not fond of the box, but fond of that corner of the room. Also, the sight of us sitting at the table eating, no matter when, always moved him to remember where his sand box was, and gave him the idea of using it immediately. His box was, by necessity, a good-sized affair. Considerably larger at that time than most house cats, particularly in the size of his paws, he had a great deal of energy, and scraped and pushed the sand around in his box—and all over one end of the room, and our feet as well, if we were too hungry to leave the table.

My oblong, wicker clothes basket was his favorite bed, and he draped himself in it, neatly covering the bottom. His attachment to the basket often led to trouble, as when I had clean clothes in it. The problem was finally solved, and Whiskers became sole owner of the basket. I did without. When I washed dishes, he neatly positioned himself on top of my feet, and only grudgingly removed himself when I had to move. When disgusted with us, he would grumble about his treatment with short, plaintive yaps. When happy with life, he purred with great gusto.

We dared not turn Whiskers loose outside, for fear of

The wildcat had his own notions about what laundry baskets are for. The problem of where to put the laundry was finally solved—in Whiskers' favor.

Rolls of tissue paper make most acceptable adversaries for pet wildcats, although perhaps a trifle on the expensive side for steady sources of enjoyment.

the trigger-happy gunners who, we were sure, would shoot first and ask questions later. Therefore, we bought a leash and harness, and each day took Whiskers for long—and for him—excitement-filled walks.

As time went by, he seemed less healthy. We often took him to the veterinarian's office, where he received a succession of treatments. He loved to ride in the back window of the car on these trips, and I think that to some extent he enjoyed the startled way in which service station attendants and passing motorists greeted his appearance.

The cat that seemed so nearly human to us became steadily weaker, and one night we thought he would die. We made him a bed in our room, on the floor. In the middle of the night he weakly climbed up on our bed, and we gladly allowed him to spend the rest of the night snuggled between us. Much to our surprise, by morning Whiskers was better, and continued to improve for the next few weeks.

Perhaps, that night when it appeared Whiskers would die, we felt that fate was taking a hand in things. Our first child was to be born soon, and, sadly enough, we could not find a place for Whiskers in the new scheme of things. We were advised that bobcats and small babies do not mix happily. Also, a cat and his sand box in a small house do not lend themselves to the cleanliness necessary for the proper rearing of children. We evaded the issue until the day my new son and I arrived home from the hospital. It was a hard task my husband had to perform that afternoon. He took Whiskers to a children's museum, where he would be given good care and plenty of attention. I could not even force myself to see the cat, before he was taken away. I felt like a traitor.

We learned a few weeks later that Whiskers was dead. He had jumped off a low table, and died almost immediately. An autopsy showed that he had died of a broken back, after having been born with a latent lethal gene—his bodily make-up was defective at birth, and his body was not able to use calcium to build strong bones.

Probably if he had remained in the wild, after birth, he would not have lived for any length of time in that constant battle for survival that all wild creatures must face. A quirk of fate brought him, instead, to us; and our special care kept him alive for some time. Perhaps his weak constitution was the reason for his affectionate nature. Rather, we like to think that we were fortunate enough to have for a pet one of Nature's wild animals, whose character was such that it became truly tame.

Commas in the Sky

By DONALD H. LOKKE
and VIRGINIA S. LOKKE

WEBSTER defines the comma as "a point [,] used in writing and printing to indicate separation of words, phrases or clauses from others not closely connected in the structure of the sentence." In form, it is a dot or period with a tail curving down and to the left. Now and then you will see clouds in the sky that fit the description of a comma. Their resemblance is so close that even the official manual of cloud-forms published by the United States Weather Bureau compares them to a comma. Here is their definition of a cloud called *cirrus uncinus:* "Cirrus in the shape of a comma; the upper part either ends in a tuft, or is pointed."

Such high clouds are composed of ice crystals, and usually have the appearance of feathery wisps. They sometimes give the first visual indication of an advancing warm front, or shift of air masses, and forecasters make use of them as harbingers of weather to come. Just as the comma may separate two clauses in a sentence, so may *cirrus uncinus* be near the boundary between two large masses of air of different properties. The clouds actually occur just above this boundary in the warmer air which is sliding up over the thin wedge of cold air below.

"Pay attention to your commas," is good advice not only for English students but for amateur meteorologists, too. Here is some of Nature's punctuation.

Grammar is not restricted to the classroom alone, for the sky has its punctuation mark in *cirrus uncinus*, the comma in the sky.

"If they would drink nettles in March
and eat Maywort in May,
So many fine maidens wouldn't go to
the clay."
. . .an old rhyme

In the "good old days," the gentle winds of spring brought

Sulphur and Molasses Time

By ROBERT C. BAUR

Photographs by William H. Bodge

When the bottom showed in the apple barrel, back in the good old days, it was time for grandmother to bring out the tonic jug. Attuning the family to spring was an integral part of the season. Folks were not as vitamin-conscious as they are today; but, after a winter of corn bread and pork, the blood needed thinning to meet the renewed activities of the spring season. That lazy, listless feeling, inspired by the first warm spell, was countered by the application of innumerable remedies. Guided by a dog-eared doctor's book, the housewife purged her family of its winter ills.

Spring tonics varied with the locale, and with the abundance of materials at hand. Comprised of bark, roots, sprouts and berries, the tonic was administered under various disguises. It was spooned, chewed, drunk steaming hot, stewed with sugar and spice, or baked between a crust. Children, weary of skates and sledding, knew that tonic-time meant marbles, tops, and kite-flying.

A timely dose of sulphur and molasses was one of the trials that made growing up such a painful process. Universal for the treatment of spring fever, its British counterpart was known as sulphur and treacle; and, swallowed with closed eyes, only thunder and lightning seemed lacking in this atrocious combination. Two parts of molasses to two parts of sulphur, and a spoonful before breakfast was the standard rule wherever this bitter remedy was administered. And, while young and old alike shuddered at this bitter draught, there also were many milder medicaments for winter-weary youngsters.

The word sassafras was synonymous with spring tonic. Indians boiled the golden blossoms, and the mysterious oddly patterned leaves; and, as a blood purifier, one old recipe called for a handful of roots, steeped for ten minutes in two cups of boiling water. Two teaspoonfuls of this were to be taken on an empty stomach, each morning for three weeks. Although sassafras, sweetened with sorghum molasses, was a household beverage, spring was sassafras tea-time, for at that time of year, the roots could be boiled in maple sap.

Maple sap provided a ready sweetened base for other tonics, too. Tasting of the March wind and the upland snow, maple sap still is enjoyed as it drips from the spile—clear, cold, and sweet, it is a toast to the newborn spring. Also, the sugar maple supplies the "sapsickle," an annual treat especially designed for small boys. The Reverend Samuel Peters found butternut sap as refreshing as that of the sugar maple. In his *General History of Connecticut*, published in 1781, he told how, in February, the butternut yielded a sap from which were made sugar, molasses, and vinegar. Both saps, in his opinion, made a pleasant beverage, without boiling—"the best punch ever drank in Connecticut."

Many Yankees believed that herbs grew especially for the service of man, and that wintergreen was created expressly to limber rheumatic joints for the spring chores. Rattlesnake-oil and bear-oil were fine for rubbing, but a steaming cup of wintergreen tea worked marvels for winter aches and pains. The popularity enjoyed by this tiny plant is indicated by the names accorded it by our

forebears; grouseberry, ivy-leaves, hillberry, waxy plum, Canadian tea, mountain tea and deerberry are but a few of its colorful folk names. While old-timers defend the potency or true wintergreen, the advent of manufactured methyl salicylate has been a boon to the preservation of the little plant.

Black cherry bark is bitter enough to rouse anyone from their winter lethargy! The bitterness, and the content of hydrocyanic acid, has not discouraged its medicinal use, for the bark also contains iron, starch, calcium salts, and other health-bearing components. Without the predominating flavor of black cherry, a tonic was thought incapable of dealing with "that tired feeling," and the thin, new bark, collected in the autumn, kept its qualities for at least a year.

The belief that the bitterest tonics worked the quickest cures accounts for the use of the tiny goldthread. Its finely tangled golden roots furnished a bitter tea that was administered as a spring tonic, and as a cure for the cankered mouths of infants. Root-doctors prescribed calamus root, or sweet flag, for a multitude of ills, and, when everything else failed, there was always a dish of calamus tea. Listed in medical books as sweet flag, cinnamon sedge, sweet root, or myrtle grass, a Scriptural association with Solomon's garden was thought to endow the plant with the facility of special healing; and this is why early pioneers planted the sweet roots around Western water-holes. Everyone who went a-Maying was likely to nibble calamus sprouts; and it was known that the roots, taken for drying, shrank least when gathered in the autumn.

Kitchen gardens yielded sage leaves, useful not only for sausage and turkey stuffing, but for bitter spring draughts as well. Aside from its value in conditioning the system, cold sage tea was used as a hair-wash. Catnip and peppermint were other herbs in demand as blood purifiers. Catnip tea, the product of early coastal gardens, was adopted enthusiastically by the Indians. Fresh catnip leaves were considered a healthful addition to spring salads. Coltsfoot leaves and tea made another tonic combination, and newly opened wormwood leaves were boiled as a digestive aid. As broth, or eaten raw, the roots of the sweet cicely were believed to renew the octogenarian's lease on life.

Concoctions from the hemlock, spruce and white cedar could be brewed while the northern woods were deep in snow, and early explorers learned from the Indians that the arbor vitae, now known to be a source of vitamin C, was capable of curing their men of scurvy. Connoisseurs of basswood tea were obliged to wait until the tardy basswood blossoms opened. This tea, made from fresh, fragrant flowers, was sweet and well-flavored, and was said to be especially good for indigestion. The blooming basswood trees, humming with bees, were easily located by ear. Teas were *eaten*, also. Strong herb solutions were solidified with flour, and rolled into balls. One such tonic pill was an ample dosage for the case of spring fever.

But teas and bitters held no monopoly in the field of spring tonics. The glad cry of "pussy willows are out!" meant that winter diets would soon be enriched with fresh greens. A tardy spring and a dwindling supply of root vegetables was likely to create a deficiency known as "the six weeks' want." Settlers homesteading in advance of the dandelion welcomed this fellow immigrant when it finally appeared in their fields, and a craving for dandelion greens prompted some to send back East for the seed. No longer confined to spring use, the dandelion is canned for year-around consumption, and spring is official, in many households, when the menu includes a salad of dandelion greens. Salt, pepper, oil and vinegar cannot disguise the bitterness that will remove any lingering suggestion of winter, and some historians think that the salad of bitter herbs, eaten by the ancient Israelites, may well have included the dandelion.

Sluggish systems were toned up with infusions of horseradish roots in dandelion wine, and every household had its wine recipe that called for a gallon of blossoms, gathered while the sun was shining. Rhubarb was a familiar tonic plant. Early stalks were encouraged with a shovelful of chicken litter and a bottomless bushel basket; and, stewed with sugar and spice, or baked beneath a crust, rhubarb was the first-fruit of the newly-thawed earth.

Backwoods settlers satisfied their cravings for green food by boiling green-brier sprouts. Beech leaves, too, were savored as a potherb, and vegetable-hungry folks in Maine once turned in desperation to the trillium, which they called, in allusion to their difficulties, "much-hunger!"

According to tradition, the hylas, or spring peepers, are frozen under the ice three times before the graceful Solomon's-seal appears in the woods—and Solomon's-seal was highly regarded as a blood purifier.

Sassafras, sweet birch and other aromatic buds were

Grandmother did not lack for remedies when the first balmy breezes of spring brought with them a lazy, listless feeling among the members of the household.

chewed to invigorate the system. The effects of a long winter were dispelled by chewing black cherry buds, which were valued as highly as a doctor's prescription. Alder buds were particularly appealing to the young, because they produced saliva that made olive-brown spots on the late winter snows. Waugh, and other writers on Indian foods, tell us how the Iroquois chewed the bast and buds of the basswood, in the spring.

Pleasant nibbling was afforded by "pippins," as the newly-opened leaves of wintergreen were called. Wintergreen berries that escaped the sharp-eyed grouse were sweet and plump from lying beneath the snow, and they were once plentiful enough to be sold in Boston markets. The new bark of the spicewood made tasty chewing, too. In June, strips of the juicy inner bark of the white pine were eaten by country boys, and the new shoots were candied by their mothers.

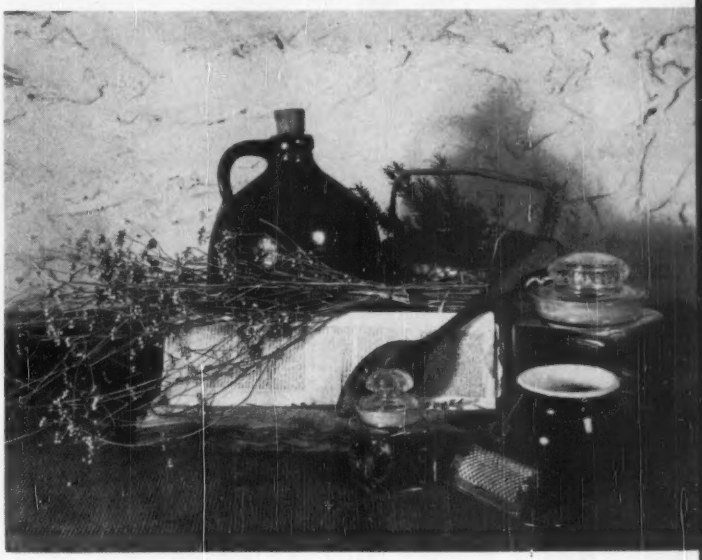
A nineteenth century writer of botanical lore recalls a slippery elm in her home town from which a heavy toll of mucilaginous inner bark was taken by youthful chewers, each spring. Jaws were also exercised with spruce gum, as well as the sticky masses covering the injuries of plum and cherry trees. South of the lingering snows, there was the resinous exudation of the bitter-tasting, but aromatic, sweet gum. One writer tells the story of how he went to a school where everyone chewed sweet gum except the teacher, who chewed tobacco!

As an escape from early dooryards, tansy soon joined the fellowship of native flowers. Known also as bitter buttons and parsley fern, the pungent leaves flavored the tansy cake that was a celebrated Easter delicacy. John Gerard, the noted sixteenth century herbalist, said of these cakes: "In the spring are made with the leaves hereof newly sprong up, and with egs, cakes or tansies which be pleasant in taste and goode for the stomacke." One medieval spring recipe called for tansy, feverfew, parsley, violets and eggs, fried in butter and sprinkled with sugar. The "minnow tansy," recommended by Izaak Walton, was fried with egg yolks, the blossoms of cowslip and primrose, and a little tansy.

In New England, where tansy flavored the traditional Fast Day pudding, leaves steeped in a bottle of Jamaica rum produced a stimulating spring drink known as tansy bitters. Like tansy, caraway often wandered afield. An ounce of caraway seed, one-half pound of sugar, and a quart of brandy were aged two weeks, and bottled for that quick pickup!

Other spring eye-openers were made by pouring rum or whiskey over bitter-tasting fruit, bark or roots. Preserved blackberries, wild geranium root, tulip and black cherry bark were stewed with sarsaparilla, and then distilled and blended with brandy and witch hazel leaves. The black cherry is still known as the rum-cherry, because its fruit flavored a tonic drink known as cherry-bounce.

The debilitated condition of returning Civil War veterans created a postwar bottled-tonic boom, and so-called Indian herb mixtures were popular. Any tonic to which the Indian label was applied convinced the consumer that he was getting Nature's finest. Itinerant, self-styled doctors, equipped with a smattering of Greek and Latin, added brimstone, alum and gunpowder to

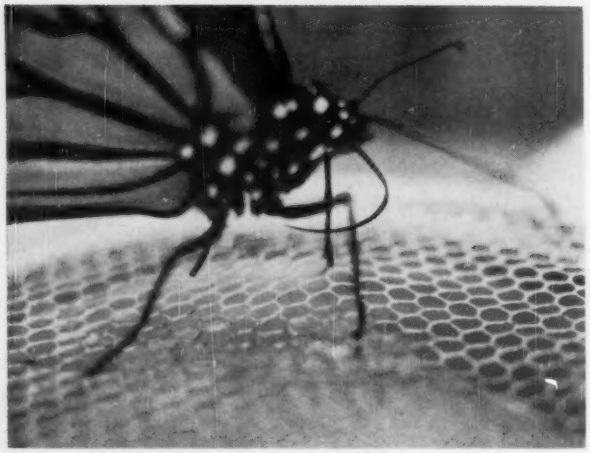


The medical paraphernalia necessary for the treatment of scores of ailments was quite simple, usually consisting of a dog-eared medical book and numerous preparations made from herbs, roots and bark.

such root–and-herb-decoctions. Spring periodicals advertised tonics that were guaranteed to send the reader singing into April. Dr. J. C. Ayer's *Sarsaparilla* was especially recommended for "debility peculiar to spring." It contained, besides tropical sarsaparilla, mandrake, yellow dock and other roots of great repute.

Then there was also Sand's Sarsaparilla, Burdock Bitters, Kidneywort, and Drake's Plantation Bitters. Hostetter's famous stomach bitters was pleasantly flavored with oil of anise and coriander. Composed of rhubarb, orange-peels, cascarilla, wormwood and germander, Dr. Stoughton's *Elixir* was a standard household remedy. Despite their alcoholic content, such tonics attained much of their popularity through extensive advertising in the religious press.

Those who neglected the annual tonic ritual were reminded of the need for stimulation when the herb peddler came around. Hawkers, selling bunches of mint and catnip, were signs of spring on city streets. The horseradish vendor closely followed the spring thaw, and girls who found that spring sunshine multiplied freckles applied grated horseradish and buttermilk to their faces. Hardier souls, with little faith in vegetable remedies, drank water from the last March snow, or ate hailstones from the first summer shower. Others stressed a generous lubrication, inside and out, with grease from the Christmas goose. A camphor bag (*continued on page 162*)



The monarch butterfly illustrated is turning its tongue backwards to pat, or "wash," the thorax, or body.

Do Butterflies Wash?

By ALICE L. HOPF

Photograph by the Author

MANY OF US have seen such insects as flies, bees, or ants making their toilets, and going through an elaborate process of scraping and cleaning the antennas, legs and wings. But do the butterflies, with their great wing-span and comparatively short legs, do the same? I had an opportunity to make some observations about this question one autumn, when I was releasing some monarch butterflies that I had bred and marked for migration study.

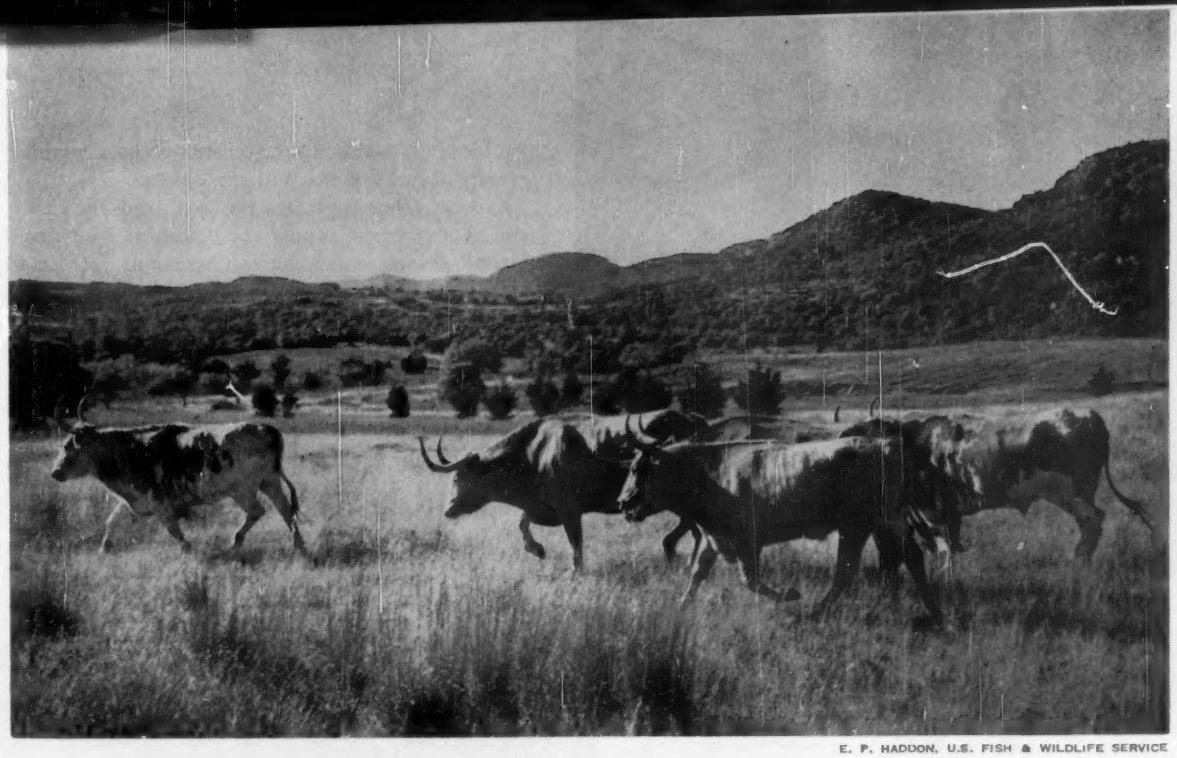
I placed one butterfly on some phlox, and watched to see what it would do. It was still early morning, and the insect seemed in no hurry to fly away. The insect began to explore the flower, and I expected to see it poke its long tongue down the little hole in the center of the blossom, to extract the honey. But the tongue did not go down the hole. Instead, the butterfly was lightly touching the surface of the petals with its tongue; and, as I looked closer, I saw that the petals still held some drops of the early dew. My butterfly was refreshing itself with plain water. Furthermore, I saw that it was turning its tongue back upon the body, repeatedly touching the dewdrops and then patting the thorax.

The butterfly soon flew away, to follow its migration route to the sunny South. But I since have been able to confirm this observation at my leisure. Among the many butterflies that emerge in my cages, occasionally there are individuals that for one reason or another are crippled or deformed, and unable to fly. Sometimes they are quite strong in other respects, and I have kept several such insects in the cage for varying lengths of time. By making sure that they eat at least once a day, they can be kept alive for a fairly long period—the longest so far being about four months—and, in the meantime, I can watch their eating and "washing" processes under a hand-glass. I mix sugar-water in a small jar lid, and over this I stretch a bit of netting, holding it tight with a rubber band. The butterfly stands on the netting, and, if it does not begin to feed promptly, I gently uncurl the tongue with a pin, until it is touching the sweet liquid. This will usually start the butterfly feeding, and it will suck up the nectar through the holes of the net.

The monarch butterfly goes through a variety of gyrations while feeding. It uses its long, strong, supple tongue in a tactile and exploratory manner. Sometimes the insect sits up straight on all four legs (although six-legged, like all insects, the two front legs of the monarch are so small as to be useless, and almost invisible to the casual glance), and sucks in a straight-forward manner, even being content to get liquid that is adhering to the netting. At other times, it will stand almost on its head in an effort to get the tongue as far down into the liquid as possible. Sometimes the insect will fussily dab and poke with the tongue all over the netting and the lid, as though constantly in search of a better drink! It is when this "poking about" starts that the monarchs are apt to begin flicking the tongue backwards upon the body. One individual pulled its tongue back and forth along the thorax, much as a person might pull a bath towel when wiping the back!

I have watched a number of other species of butterflies, feeding in captivity, in the hope of spotting this activity among them, but I have never seen any of them but the monarchs "wash" themselves.

I would expect it to be butterflies with long tongues that would do this sort of thing; and, for that reason, I looked especially at the swallowtails. However, although both swallowtails and monarchs have long tongues, the swallowtails curl their tongues in front of the head, when not in use. The monarch curls its tongue underneath the head, and to the rear. Perhaps this fundamental difference is the reason that the monarch seems to have developed the "washing" habit. Perhaps, in curling the tongue backwards at the end of a meal, it accidentally hits the thorax, and then continues to do so for pleasure or exploratory reasons. There may be other butterflies that do this, and more observation might uncover such a fact. If so, it would provide another remarkable trait peculiar to these insects.



E. P. HADDON, U.S. FISH & WILDLIFE SERVICE

One of the most important pasture plants of the West is buffalo grass, which is especially well-adapted to areas of the Great Plains country that are least suitable to the growth of other grasses.

Over the years, many have found that

Grass Is Adventure

By CHARLES MORROW WILSON

Sugar cane is one of the Old World grasses, a plant that keeps both the sweet tooth and the dentist happy.

During the summer of 1729, Timothy Hanson, a twenty-three-year-old farmer from what is now the town of Keene, New Hampshire, rode horseback to Boston, intending, so his diary noted, to "taik on a larke." But Timothy's "larke" somehow ended aboard a wool sloop that was hoisting sail for Bordeaux.

In the course of his enforced wait in the French port, Timothy spent time roaming the green and sunny hinterlands where, with customary directness, he picked a pretty French bride, and a hatful of the ripe seed of a beautiful grass that grew bountifully in open pastures, and on village commons. Having shared his last name with his bride, the Hampshire Grants lad chose to share his first name with the beautiful new grass; new, at least, to him. With engaging modesty, he renamed it "Timothy's Grass."

By the beginning of the American Revolution, Timothy's Grass, small-typed to timothy, had become the foremost hay crop of the American colonies. A century later, timothy was the foremost hay crop of the United States, and it remains one of the first three.

The spring following his great adventure, the groom planted the hatful of grass seed in his yard. The next fall, he harvested, flailed, and sun-cured enough of the seed to plant a small meadow. Having extended his meadow to perhaps thirty acres, and fattened his cattle, Farmer Hanson put into practice the fine old Yankee adage, "All that be not needed to home—peddle." First locally, then in various neighboring colonies where hay and forage crops were chronically short of requirements, Timothy set out to peddle the seed of Timothy's Grass.

After nine years, and with his good wife driving second wagon (Timothy naturally drove first wagon), he

PHOTOGRAPH BY THE AUTHOR

This is the field Timothy Hanson is said to have planted to "Timothy's Grass," some 190 years ago. The oldest timothy mowing in the United States still is producing a mixed stand of this famous grass.

extended his grass seed peddling south into New Jersey and Pennsylvania, and eventually into Maryland, where the Hampshire couple presently settled to a pleasant life of green hay fields, fat cattle and a career of peddling grass seed.

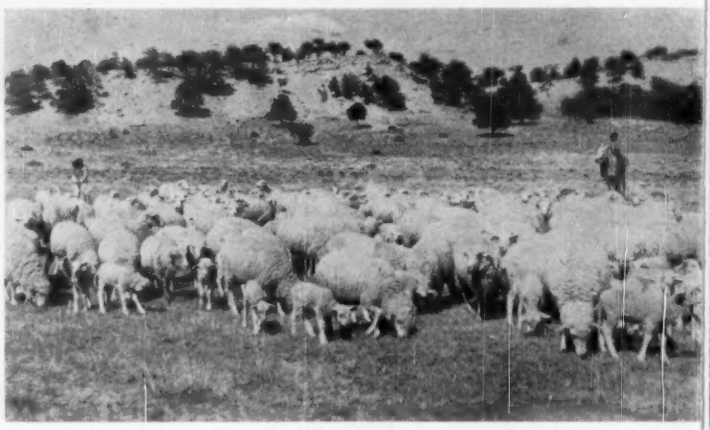
Theirs was good and profitable adventure, centered on a single species of grass. Today, about 4500 grass species and subspecies have been classified botanically, with some 1500 believed to be native to North America. But during Timothy Hanson's time, and the greater part of a century thereafter, our Great Plains, one of the earth's great strongholds of indigenous grasses, was largely inaccessible to the new United States. True, the latter was blessed with some distinguished grasslands, such as the piedmont and tidewater prairies, and the great meadows of Kentucky. But the dominant plant cover of the Atlantic seaboard remained one of trees; and, for well over a century, inadequate grazing remained the Achilles' heel of a necessarily agricultural and pastoral economy.

Even today, adequate grazing—the word "grass" is derived from "graze"—is still an acute problem. Only rarely is good forage grass in surplus more than a few days, or weeks, in late spring or early summer. During the greater part of every year, and throughout most of the nation, it is in short supply. Thus, the pursuit of finding and developing better forage grasses gains in significance and scope.

As in other adventurous pursuits, there is ample opportunity for making mistakes. A century after Timothy Hanson had proved himself right as rain with his introduction of a "Propre Haye Gras," Governor James Mead, of South Carolina, made a bold try at introducing another "propre" grass that he knew was badly needed in home pastures. By way of an accommodating shipmaster, the Governor acquired from "distant ports of India," a packet of grass seed that he turned over to a neighbor planter named Colonel William Johnson.

Colonel Johnson planted the seed, took the credit, and shortly began taking the blame, as "Johnson's Grass" became a far and fast spreading menace to cotton, tobacco and all other row-and-hoe crops. This import from India is still a serious nuisance to farmers in some thirty States; and, like witchgrass and crab grass, which were likewise imported deliberately and sold commercially as forage grasses during the 1840's, its principal benefactors are birds, not boys who hoe gardens.

Fortunately, the grasses, which are the largest race of flowering plants, are also the most beneficial, both to people and the soil on which we live. More than a century after Timothy Hanson's death, another



SOIL CONSERVATION SERVICE, U.S.D.A.

The Navajo Indian sheep herd in this grass demonstration area is grazing on typical desert-type native grasses, mostly low grama and sand drop-seed.

observant American "sort of stumbled over"—as he said—another grass that has now become "historic." We call this grass, now a number two plant that appears headed for number one position, Bermuda. But *Cynodon dactylon* certainly did not originate in, or near, Bermuda. Since 1912, American plant explorers have brought home sub-species and varieties from such distant lands as India, Cyprus, Italy, Tunisia and Egypt. Oddly enough, according to the records, "Bermuda grass" was actually discovered at Fort Smith, Arkansas, back in August, 1889, when a drought-harassed farmer named Harry Kelley noted a United States marshal's horse grazing on a solitary plot of green, in an otherwise dying pasture.

When rain came, Kelley "borrowed" a tubful of the sod, and planted it in one of his badly-spent pastures. Four years later, Harry Kelley's father, who chanced to be a chairman of Kansas State College, came visiting, and promptly directed Dr. A. M. Ten Eyck, the college's agronomist, to take seed and sod for planting in Kansas. Next, John Fields, director of Oklahoma's first experiment station, visited Kelley's pasture, took seed and

sprigs of the "new" grass, and established it on test plots in the "Indian Territory." Fields successfully isolated, and selectively developed, a fine-stemmed variety for forage and a hardy, drought-resistant type for Southwestern lawns.

Next, beginning in 1909, another Oklahoman, John Mitchell, who presently changed his name to "Bermudy" Mitchell, began to grow the "new" grass and sell its sod and rootsprigs by mail. So successful was he that, while fellow Oklahomans were getting rich from oil, Ole Bermudy was getting rich from Bermuda grass! Interestingly enough, the sprig-selling sage succeeded most brilliantly in introducing Bermuda grass as a "living lawn cover" for town and farm homes throughout the Southwest, where yardways had previously been nearly, or entirely, bare. From home lawns, the Bermuda tended to work its way into pastures and ranges, and along roadsides.

PHOTOGRAPH BY GILES G. HEALEY

In some parts of the world, grasses are still counted among the basic building materials, as evidenced by this Indian hut at Chiapa, Mexico.

About two-thirds of all active farmlands in the United States are now planted to grass crops. Of our thirty principal grass crops, only one—maize, or Indian corn—is native to North America. Yet, our native grasses, which continue to inhabit a tremendous area of the United States, west of the Mississippi, are regarded by many as the world's greatest field for adventure in grass.

The vast hodgepodge of grasses in the public domain, on Indian lands, in national parks and forests and wildlife refuges comprise the greatest variety of grass species to be found anywhere in the temperate zone, and include the tall prairie grasses, like the big bluestem and Indian grass, that are nearly extinct elsewhere. At the present time, switch grass and buffalo grass, the greatest of the medium prairie varieties, are responding especially well to selective breeding and other adventures in restoration. Many experts regard these and other neglected natives as green hopes for the future of the United States, as well as much of the world of tomorrow.

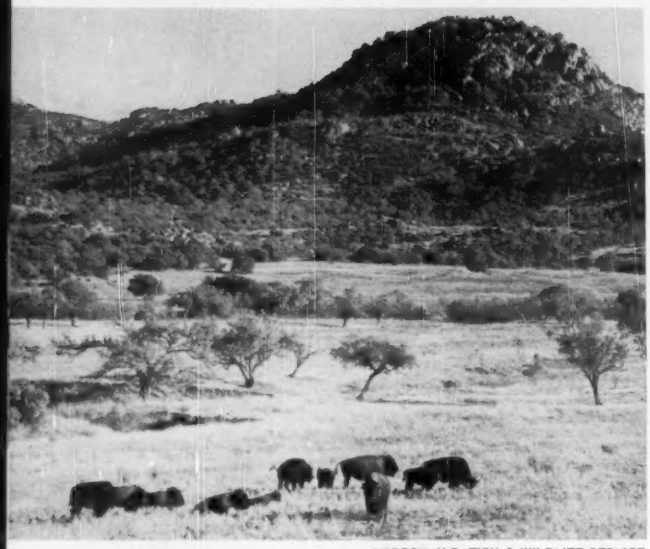
Unquestionably, the bluestems, or *Andropogons*, which are as American as our native Indians, are among the main reasons for the hopes of the experts. The beautiful big bluestem is not only a perennial; it might be said to be virtually immortal. Some botanists insist that big bluestem, rather than the redwood tree, actually is the "oldest living thing," with root-parts that may have been alive for more than 5000 years.

There is no doubt that some of the greenest pastures for grass adventure still may be within our own boundaries. Even the special corps of plant explorers of the United States Department of Agriculture grant *that* point, by adding to their globe-circling itineraries the lesser-known areas of the American West. The same view is taken by the men who have done so much to make the Soil Conservation Service, and its successors, one of the world's most successful conservation agencies. But, regardless of their origins, Soil Conservation agronomists have tried hardest to fit specific grass species to the needs of individual localities. This was well demonstrated during the late 1930's by the nearly single-handed work of Dr. Franklin Crider, who successfully introduced three sub-species of drought-resistant South African love-grasses to the dying ranges of the American West.

Our adventure story must include the able and

Maize, or Indian corn, is the greatest of the native American grain crops both in quantity and value, and is grown in all of the forty-eight States to a greater or lesser extent.

PHOTOGRAPH BY LEE, F.S.A.



HADDON, U.S. FISH & WILDLIFE SERVICE

A small group of buffalo cows and calves, part of one of the largest herds in America, feeds on buffalo grass in the Witchita Wildlife Refuge, near Cache, Oklahoma. Black Bear Mountain forms the background.

neighborly introduction, by way of Nebraska, of smooth brome grass from eastern Hungary. Back in 1931, Dr. F. D. Keim, of the Nebraska Experiment Station, set out to find and prove a grass that his State highway department could use to protect highway shoulders from wind erosion. With the help of highway workers, Dr. Keim succeeded in starting the immigrant grass along several test areas of drought-tortured roadside. By 1937, the stands had become sufficiently widespread to allow the Nebraska Highway Department to invite drought-stricken farmers and ranchers to harvest seed from the roadsides, for planting in their pastures. About 200 farmers accepted the invitation. Some brought with them their combine harvesters, while others went after the seed "Timothy Hanson" style.

During 1938, smooth brome grass began to flourish in Nebraska pastures and ranges, and to save starving cattle. By 1941, this species was growing in at least a quarter-million pastures and fields, throughout the seven Great Plains States, and privately owned seed farms were prospering by producing and selling smooth brome seed. The same succession of years saw the introduction or development of many valuable wetland and waterfront grasses from Africa, including Rhode grass, St. Augustine grass, and thatch grass. The green and wetland immigrants from Africa have helped greatly in the unprecedented gains in cattle-raising that have been registered by Florida and the neighboring Gulf States.

At present, there are at least 1433 grass research projects in progress at experiment stations throughout the United States, and, since 1941, at least 1700 new or improved varieties of grasses have been introduced to the commercial markets of the country. This great library of grass adventure stresses the three principal directions of progress—the discovery and adaptation; the improvement in productivity or utility; and the fight against diseases and natural enemies that inevitably threaten.

The Timothy Hanson story remains, perhaps, our classic of discovery and adaptation by an able and persistent amateur. But fairly typical of the rapidly expanding field of utility improvement of well-known species is the career work of Dr. Harry R. Rosen. In 1920, Dr. Rosen earned a degree in plant pathology from the University of Wisconsin, and even earlier he had entertained visions of a nation that might be green in January, as well as in July. On moving to the University of Arkansas, Dr. Rosen found himself in a potentially great livestock country that was being depressed by what he deemed to be an avoidable lack of winter grazing.

Years earlier, Dr. Rosen had begun a private study of the winter growth of grasses. Like other observers, he knew that common cereal grasses, including oats, wheat and rye, are the most-grown winter grasses. But, through the centuries, their potential winter grazing values have been marred by the habit of "ground-spraddling," a phenomenon ascribed to the plants' attempt to receive greater heat radiation from the ground.

Harry Rosen doubted this. His own experiments indicated that the very vegetative genes that encourage upright growth are frequently the most cold-resistant. So the inquisitive pathologist began a fifteen-year adventure in the hybridization and selective breeding of a winter forage oat. With the sixteenth generation, he succeeded in "clamping together" a healthy winter forage oat. He named it the "Traveler," and saw it double the oat acreage in nine border States of the South. His next adventure produced the "Arkwin" oat, which, with forage yields of between five and six tons per acre between November and April, has (*continued on page 163*)

Here citronella grass is being harvested on a farm near Santa Rosa, Guatemala. From this grass is extracted oil of citronella, used in perfumery and in insect-repelling preparations.

Liberty Hyde Bailey, The Builder

By E. LAURENCE PALMER

Illustrations by Frances McKittrick and Elizabeth Burckmyer

This is the ninety-fifth of NATURE MAGAZINE'S *series of Educational Inserts*

LIBERTY HYDE BAILEY

IT IS appropriate that the ninety-fifth insert in this series should deal with the contribution to the field of Nature of a man who for ninety-six years dedicated most of his life to the study of Nature, in one form or another, by one means or another, and for many purposes. The fifteenth of March, 1958, will be marked by naturalists far and wide as the hundredth anniversary of the birth of Liberty Hyde Bailey, who died December 25, 1954. On Dr. Bailey's birthday the United States will issue at Cornell University, Ithaca, New York, a commemorative stamp honoring gardening and horticulture in America. On March 14, 1958, there will be a Liberty Hyde Bailey Centennial Celebration at Cornell, with which institution the naturalist had become identified approximately seventy years earlier.

The history of the century that followed L. H. Bailey's birth will record the near destruction of the Union, and the debacle of two World Wars that loosed destruction through the ambitions of the Kaiser, Mussolini, and Hitler. It is to be hoped, however, that the century will longer be remembered for the constructive accomplishments of men like Liberty Hyde Bailey.

Throughout his life Dr. Bailey placed great emphasis on the value of original work, and I am privileged to draw freely on the effect he had on me during the sixty-five years that I have read his writings and during the thirty-six years that I was privileged to know him personally.

CANTERBURY BELL

REX BEGONIA

In the finest and the broadest sense of the word, L. H. Bailey was a builder. Both quality and quantity characterized what he did. He built a literature. He built institutions and organizations. He built whole new areas of scientific and human interest, and, by example, he built a pattern for wholesome constructive living that had and long will have a stimulating and valuable effect on the human race.

To preserve the established pattern that has been followed in most of these inserts, the illustrations and tabular material in this article deal largely with plants representative of Bailey's major interest as a botanist.

More than forty years ago I first attended some of the meetings of The American Association for the Advancement of Science. After religiously sitting through some of the technical sessions, I decided to take "a breather" and see what Dr. Bailey had to say at a meeting of The American Nature Study Society. I stood at the back of a large hall, because there were no vacant seats. Among other things, I heard him read "The Great Lover," which Rupert Brooke had only recently written and in which Brooke expressed his joy in a well-rounded life. The poet said that the full life experienced

"The pain, the calm, and the astonishment,
Desire illimitable, and still content."

WALL JASMINE

SHOW GERANIUM

INLAND SEDGE

I felt then, and I feel now, that the union of the restless energy and the disciplined calm of Liberty Hyde Bailey never was better expressed. I think that his ability to put chaos into gracious order was possibly his greatest contribution, along with his ability to refine the support of confused observations on a host of subjects, and to unite the unorganized desires of able persons to reach a worthy goal. If I may repeat, he attained his objectives by many means. Possibly he was most successful in building a literature; building institutions and organizations; building and strengthening new areas of human interest; building a pattern for personal and social living that is matched by few persons.

The Builder of a Literature.

Liberty Hyde Bailey was a happy combination of teacher, researcher, administrator, farmer and man. He recognized that great things can be accomplished most effectively if pen and printer's ink are used wisely to help the world profit by experiences in the classroom, the laboratory, the office and the open country, as well as in the halls of government. To this end, Dr. Bailey early developed skill in lucid writing, reliable illustration and effective speech. His reputation as a writer, a researcher and an administrator have outlived, but have not excelled, his reputation as a teacher during the quarter of a century he was involved in the teaching profession directly.

As is usually the case, the pattern of a man's work is influenced by his early life much as the nature of any organism is affected by what it is fed, especially in its formative years. Young Bailey was brought up in a pioneer atmosphere by an intelligent family disciplined, by the circumstances of making a living, to deal with reality and to avoid wasted materials, energy and time. He cut his literary teeth on *The Bible*, Bunyan, Milton, Darwin, and Gray. He never attended what we call a high school but learned, in a rural school, the grammar, geometry, and Latin that enabled him to enter college directly from a rural school, and later to produce—as writer, illustrator, editor, and planner—a phenomenal literature dealing primarily, but not wholly, with the science of botany and of rural life.

Dr. Bailey was a prodigious writer. As an example, he published more than one hundred scientific papers between 1922 and 1949. These included a thousand-page monograph on *Rubus* in North America, in 1945, and was followed by generous supplements in 1947 and 1949. In the first ten years he was at Cornell, he wrote twelve books on horticulture, and during a ten-year period wrote six botany texts for use in secondary schools. One of his books contained such a complete bibliography that it called the attention of deVries to the little-known works of Mendel and stimulated the whole study of genetics.

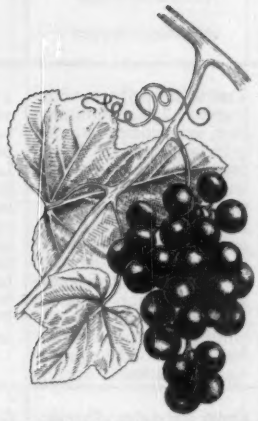
The botanist wrote manuals and handbooks dealing with cultivated plants and with their culture, edited encyclopedias of agriculture and of horticulture, prepared exhaustive monographs on such difficult groups as

CARNATION

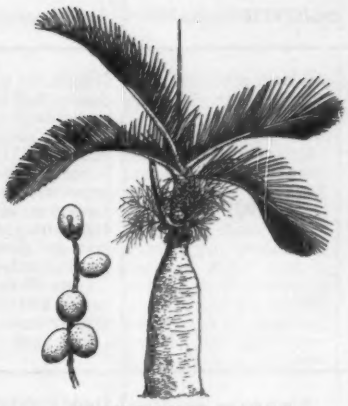
BLUNT PLANTAIN-LILY

GOURD

BECCARI PALMETTO



LABRUSCAN GRAPE



PLUM-NUT PALM

the palms, the sedges and the raspberry group. He edited such influential publications as *Country Life in America*. He prepared a manual of rules, formulas and tabular information helpful to farmers, gardeners, stockmen, foresters, poultrymen, teachers, and others. Through his encouragement, Cornell University published literature helpful to teachers and pupils interested in interpreting the rural environment. The Cornell Rural School Leaflet has been published as one of these for more than fifty years. Without his sponsorship it probably would never have been started.

L. H. Bailey insisted on accurate illustrations, forgoing artistic pictures for those effectively showing significant detail. He began photographing foreign collections and bringing the pictures to America for reference. In the early days of this activity he lost some $400 worth of pictures, not counting the work involved, when a customs officer opened all of his boxes of exposed but undeveloped plates and then determined the customs charges on the shipment.

HONAN HIBISCUS

In the production of literature, whether it was for children's use, to guide technicians, to develop a philosophy, or to express appreciations poetically, Dr. Bailey worked according to a plan, laying out what he intended to do and sticking to his schedule as far as possible.

The Builder of Institutions and of Organizations

Liberty Hyde Bailey left on many institutions and organizations the indelible imprint of his ability to build. Working with Beal and others at Michigan State, he was so dynamic that an administrator who was asked what the naturalist was doing replied that he would make a report if he could ever catch up with the man. After a short, but important, stay at Harvard, he came to Cornell University's College of Agriculture. He is reported to have come in part because Cornell asked him what he wanted to do, while Michigan had asked him how little he needed on which to get along. Fifteen years after L. H. Bailey came to Cornell he became the second dean of the University's College of Agriculture, and a year later became the first dean of the New York State College of Agri- (*continued on page 144*)

GRU-GRU PALM

DEWBERRY

CANNA

COMMON NAME SCIENTIFIC NAME	INLAND SEDGE *Carex interior*	GRU-GRU PALM *Acrocomia hospes*	BECCARI PALMETTO *Sabal beccariana*	PLUM-NUT PALM *Mascarena lagenicaulis*
DESCRIPTION	Height, to 13 inches, in dense heads, slender, wiry. Leaf blades under 1/10-inch wide and rather flat, though may form a groove, usually crowded at base and longer or shorter than the fruiting stalk. Stems crowded closely at base. Leaf sheathes closed at base. Roots rather tough and fibrous, and greatly crowded.	Tree to 40 feet high, with trunk to 1 foot in diameter, appearing relatively slender, often with top bent. Trunk covered with leaf bases variously decayed, cylindrical. With spines but *no spines on spathe*. Leaves to 14 feet long, more or less erect at top, with spineless segments smooth and shining above and whitish beneath; to 3 feet long, like great feathers in many ways.	Tall, thick-trunked tree with trunk covered with bases of broken leaf-petioles. Head open. Leaves to nearly 5 feet long and as wide, with long petiole. Leaf segments borne from common axis, ½ length of blade, about 100 in number, green on both surfaces, to 3 inches wide. Petiole as long as or longer than blade of leaf.	Stout, erect palm, to more than 15 feet tall with thick, closely ringed trunk that contracts quickly into a bottleneck below the flowering area. Leaves in head, and often arranged to form a cross; with to 60 pairs of leaflets each to 2 feet long and 2 inches broad, with a petiole to nearly 1 foot long, dull, showing 3 strong and many fine ribs beneath.
RANGE AND RELATIONSHIP	Order Glumiflorae. Family Cyperaceae. This species ranges from Arizona to British Columbia being found in northern Mexico and northern California, and east to Maine and Pennsylvania. Thrives in boggy meadows. Type described by Bailey from Penn Yan, New York. More than 1000 species of *Carex* in the world and more than 350 native of the United States.	Order Palmales. Family Palmaceae. Family contains at least 140 genera and several thousand species and not too well known. This species grown under name of *A. sclerocarpa* and *A. fusiformis* in southern Florida. Its real geographic origin apparently is unknown, though it has long been grown under cultivation as an ornamental. "Corozo Palm" applied to close relative.	Order Palmales. Family Palmaceae. Some 26 American species of the genus but the origin of many of these is either obscure or wholly unknown, since travelers have long assisted in spreading species of palms over the earth. Many have been grown primarily as curiosities and as ornamentals without thought of the fine status in the genus or the family.	Order Palmales. Family Palmaceae. Superficially the Mascarene palms differ from the Hyophorb palms by the constricted and inflated trunks and by having the seeds attached inside a seed shell instead of free and loose inside the dry exterior of the fruit. Native of group of islands, the Mascarenes in the Indian Ocean including Mauritius, Reunion and Rodriguez. 3 species.
REPRODUCTION	Flower structures small, somewhat grass-like, inconspicuously brownish, with pistillate and staminate structures in separate flowers, with 3-4 flower spikes to a stalk. Lateral spikes are pistillate, with 3-10 spreading perigynia or "fruit-sacks" which are about 2 times as long as the supporting scales, and have semi-transparent margins and are blunt and brownish.	Flowers in spathe and spadix formation, the spadix being to more than 4 feet long, prominent and to 10 inches wide, long-pointed and spineless and about as long as the main spathe. Staminate flowers, to 1/5-inch long, angled and veined; pistillate to 1/3-inch long, and broad. Fruit, flat-topped, spherical, to over 1½-inch through, dull brown, rough. Seeds flattened.	Flowering structure is much branched, to 6 feet long but rarely longer than the leaves and when mature hangs downward. Fruit when mature is to 3/5-inch broad and about equal height, changing from dark gray to black. Seed is free in the fruit covering, chocolate brown, to 2/5-inch across and 1/5-inch thick, with prominent lateral micropyle scar.	Spathe of several close-fitting valves that are shed. Spadix to more than 3 inches long, smooth, bushy. Flowers, 6-8 in a group, in double lines, staminate, under 1/5-inch long and with 6 stamens. Fruit about 1 inch long and 3/5-inch broad, at first smooth but later black and somewhat roughened. Seed to 4/5-inch long, with grooved surface and embryo in hard albumen.
ECOLOGY AND ECONOMY	Fruits are lens-shaped and may be floated by surrounding structure. Bailey separated this species in 1893 from *Carex scirpoides*, which had been described in 1805. He published the description in the Bulletin of the Torrey Botanical Club, volume 20, page 426. This is one of more than 80 species of *Carex* discovered and named by Bailey in American plant study.	A peculiarity of this palm is the tendency of the upper areas to appear weak, to bend over, but with maturity to straighten up and assume what seems should be the normal position. While this grows outdoors in Florida it is more commonly grown under protection in California. It is a case of an undescribed palm coming under cultivation without being recognized.	Horticulturalists recognized a cultivated *Sabal princeps*, which has been grown widely in California, but according to L. H. Bailey the name should not be used as a valid title. It was described from a tree in the Botanical Garden of Palermo, Sicily, by Beccari, and redescribed by Bailey in 1944 after checking with specimens and photographs from that garden.	Species is in frequent cultivation from Florida to Rio de Janeiro, with some specimens known from Singapore. The specific name means that the stem is shaped like a bottle or flask. The plants are not too well known so far as their ancestry and life history are concerned. It is not too well known so far as its maximum size is concerned.
L. H. BAILEY INTEREST	From 1883 to 1904 Bailey was the accepted authority on the identification and naming of American *Carex* species. At 18, a botanist implied that the sedges were too difficult for him so he made the group one of his life's challenges. At 26, he worked over Harvard collection; at 28, published nearly 100 pages on it; and at 30, studied it at Kew in England.	L. H. Bailey described this palm, distinguishing it from *A. sclerocarpa* in *Gentes Herbarum*, Volume IV, Fascicle XII, pp. 449-452 published in 1941. He became interested in palms in Jamaica in 1910, when he was unable to name a palm that his wife noticed and commented on casually. The group became his major consuming interest at the end of his life.	Bailey published the new description of this palmetto in *Gentes Herbarum*, Volume VI, Fascicle VII, pages 434-435 in his "Revision of the American Palmettoes." In that revision, he listed and described one species of *Serenoa* and 26 species of *Sabal* including bush palmetto, *S. minor;* scrub p., *S. etonia;* Palma de Guagara, *S. allenii;* Bahaman P., *S. bahamensis*, and others.	L. H. Bailey separated this species from *Hyophorbe americaulis* as a new species, publishing his description of it in 1942 in *Gentes Herbarum*, Volume VI, Fascicle II, pages 74-76. As early as 1928 when he wrote the section on palms in the *Encyclopedia Britannica* he had been recognized as world's leading palm authority. In 1942, Bailey Palm Glade dedicated in Miami.

BLUNT PLANTAIN-LILY *Hosta decorata*	CANNA *Canna generalis*	CARNATION *Dianthus caryophyllus*	LARKSPURS *Delphinium sp.*	CABBAGE *Brassica oleracea capitata*
Compact, relatively low plant, usually under 2 feet high. Leaf-blade oval to 8 inches long, obtuse or blunt at the tip, broad and unequal at the base and margined, with a conspicuous white band that helps give the plant its common name. About 13 conspicuous veins in the leaves, with the blades usually shorter than the petioles.	Height to nearly 7 feet. Perennial. Tropical. Leaves conspicuous, banana-like, to 3 feet long, entire, smooth, relatively thin, and with many conspicuous, parallel veins. Stems are leafy, unbranched and arise from fleshy underground structures (rhizomes). Varies greatly in size, shape, color and texture of leaves and other parts.	Height to 2 feet, with somewhat branching, stiff, medium slender stems, with swollen joints from which appear the pairs of narrow, smooth, backward-curving leaves. Some kinds are bushy in appearance, while others are not. Some are hardy outdoors while others require greenhouse care to survive, but all apparently are relatively long-lasting as flowers.	Annual garden larkspurs include: rocket larkspur, *D. ajacis*, with flowers in unbranched clusters, and forking larkspur, *D. consolida*, with flowers in forked groups. Among many perennials are the tall candle l., *D. elatum*, to 5 feet tall, with flowers in tall spike-like formation, and bouquet l., *D. grandiflorum*, also tall but with flowers in open, freely branched arrangement.	As possibly the most important crop of genus *Brassica*, cabbage is chosen here. Leaves to more than 1 foot across, nearly circular, borne in a dense terminal head. Stem is low and stout but erect. Leaves vary from purple, to glazed or unglazed green, and to smooth or puckered or blistered and are usually rather thick, fragrant, tender and nutritious. Roots from a taproot.
Order Liliales. Family Liliaceae. The origin of this species is not known but it is assumed to be Japanese. At least 8 species are listed as to be found under cultivation including the fragrant plantain-lily, the cluster plantain-lily, the tall-cluster plantain-lily, the midsummer plantain-lily and the wavy-leaved and narrow-leaved plantain-lilies.	Order Scitaminae. Family Cannaceae. The common flowering canna found widely distributed as an ornamental. To 60 species in the genus. The order includes banana, ginger and arrowroot families. *C. edulis* bears edible tubers that yield Queensland arrowroot starch. *C. indica*, Indian shot, is old fashioned green garden ornamental widely used.	Order Caryophyllales. Family Caryophyllaceae. There are some 55 genera and 1300 species of herbs in this family, which includes many popular annual or perennial garden flowers, some having been under cultivation more than 2000 years. Theophrasus gave the name *Dianthus* some 23 centuries ago, referring to the "Divine fragrance" of the flowers.	Order Ranunculales. Family Ranunculaceae. Garden larkspurs come mostly from north temperate areas around the world, there being some 250 larkspur species. Some low forms grow from sea-level to 10,000 foot elevations, with low forms favoring open, exposed areas and tall forms favoring sheltered, moist areas.	Order Rhoeadales. Family Cruciferae. Genus is native of China, the Mediterranean and coastal western Europe. Varieties of *B. oleracea* include branching bush kale, Portuguese kale, Brussels sprouts, cauliflower, broccoli and kohlrabi, as well as cabbage. In the family are also mustard, rutabaga, spinach, turnip, charlock and others.
Flower-bearing spike to 2 feet high. Flowers are dark lilac colored, to more than 2 inches long with broad and relatively short bracts at the base and with few to many flowers on an uncrowded spike. Flowers in late summer with pollination effected probably by insects. The common plantain-lily is commonly known as the *Funkia*.	Flowers with short tubes, with mostly erect parts, usually well separated, variously colored, with tube to ½-inch long and little if any longer than the supporting calyx. Petals are narrow and remain erect at maturity. Staminoidea to more than 1 inch broad and close to stigma of the pistil.	Carnation flowers are variously colored, yellow, white, purple, rose, red, or mixed, are terminal and usually single to a stalk, with the calyx forming a tube that binds the lower half while the petals spread from the throat of the calyx. Culture calls for cuttings made in January, rooted in spring and bearing flowers at the end of the year.	Larkspur flowers are usually showy, commonly blue but may be white, pink or other colors. There are 5 colored sepals with one prolonged into a spur into which are the spurs of the upper pair of petals. Fruits split when mature to free the seeds, and in some of the perennials some flower the first year after the seeds are planted.	Flowers in long, whitish-yellow clusters are produced usually after plant has been subjected to cool temperatures. Uncooled plants known to yield 3 heads a year and 6 heads in 2 years and if cooled then produce flowers normally. 2-month cooling period apparently best. Seeds should be hardened by storage at 32°F. At 6-8 weeks, seedlings may be transplanted.
Plantain lilies are relatively free of insect pests. Most mature relatively rapidly from seeds, are hardy, but have leaves killed quickly by the early frosts. Do best in deep, rich, loose soil and thrive in shade close to buildings. May be mulched lightly with decayed manure after the ground has frozen, removing mulch after frost leaves.	The genus is of New World origin and includes to 60 species, mostly found in Central America and the West Indies. The plants have long been hybridized and inbred, with one produced as early as 1863 as a cross between *C. iridiflora* and *C. warscewiczii* known as *C. ehamannii*, which formed the basis of many modern cannas under cultivation.	This is the State Flower of Ohio and one of the most popular of all cultivated flowers, in part because of fragrance and beauty, but also because of lasting power after having reached the blooming stage. It makes a perfect buttonhole flower or bouquet for almost all occasions. It is so popular that its culture has become a well-paid science.	The group includes a number of species that, while they are beautiful to see, provide a forage that is most poisonous to grazing animals, particularly sheep. Many have been so long under cultivation that their origins are obscure or unknown, and some have been produced by common cultivation practices.	Cabbage treated with sodium sulfite stores best. Antibiotic principle, found on leaves, disappears after cutting. Cabbage is a crop of major economic importance and with other members of the genus, and the family provides important food to man and to cattle and other livestock and yields other substances of value in arts and in industry.
L. H. Bailey studied this group intensively from 1925 to 1940. During that time he added 3 new species to the group. He was responsible for showing that its correct name was *Hosta* and not *Funkia*. *H. decorata* was "discovered" and named by Bailey in 1930 from garden plants introduced a century earlier from Japan, where it was found wild in 1840.	In 1923, L. H. Bailey gave the name *C. generalis* to a hybrid, probably of *C. iridiflora* and *C. warscewiczii* and named the popular orchid-flowered canna *C. orchidoides*, a hybrid probably of *C. iridiflora* and *C. flaccida*. These are the two races of common garden cannas.	L. H. Bailey was interested in the group both because of its beauty, its popularity in gardens and because of its taxonomic challenges. This interest found expression in his publication in 1938 of *The Garden of Pinks*, one of his series of four "Garden of—" books.	L. H. Bailey was intrigued by the group, probably because of their beauty, their easy cultivation in gardens and also because of their apparently involved heritage and relationships. In 1939, he wrote one of his semi-popular books on *The Garden of Larkspurs*, which illustrated his varied interests and skills as a naturalist, a writer and a serious botanist.	L. H. Bailey was intrigued by the group and its origins. In 1917, he traveled far inland in China seeking and finding primitive members of our important species and some previously unknown. In 1890-1899, and from 1923-1944, he concentrated on the group. In 1918, he made extensive collections on limestones of English coasts, the native home of cabbage.

COMMON NAME SCIENTIFIC NAME	APPLE *Malus sylvestris*	DEWBERRY *Rubus prosper*	SHOW OR MARTHA WASHINGTON GERANIUM *Pelargonium domesticum*	LABRUSCAN GRAPES *Vitis labruscana*
DESCRIPTION	Tree to 20 feet or more in height, with trunk to 3 feet through. Bark, dark, rough, scaly and bitter, but close on twigs. Twigs coarse, with fruiting spurs scar-crowded and obviously bearing many years. Leaves to 4 inches long and nearly half as wide, darker above, alternate, coarse-veined and short petioled, with margins with small rounded teeth.	Stems to more than 3 feet long, at first erect or arching, then prostrate, rooting at the tip and trailing; round in cross-section, to 1/6-inch thick, glandless. Prickles stout, curved, length to equal stem diameter, widely scattered, often to more than 1 inch apart and only rarely grouped. Leaves of main cane, of 5 leaflets; of flowering canes, smaller, of 3 leaflets.	Somewhat shrubby perennials that reach a height of 3 feet or more. Leaves vary from being soft-textured, lobeless and heart-shaped to those that are stiff, with shallow angular lobes; usually to 3 inches across, with prominent veins that are raised below. These leaves are not banded or zoned, pungently or aromatically fragrant as in some relatives.	Woody, tendril-bearing vines growing to more than 30 feet long. Leaves, alternate, sharply 5-lobed and coarsely toothed, thickish and with heart-shaped bases. Leaves, to 8 inches across, dark green above and gray felty beneath, with a petiole nearly as long as the blade is long or wide. Forked tendrils appear at almost every node in the stem.
RANGE AND RELATIONSHIP	Order Rosales. Family Rosaceae. In the same family as the dewberry discussed in another column. Apples are native of Europe and Asia but cultivated in temperate climates wherever they can grow. Some 500 varieties have been developed suited to eating, pie-making, cider, evaporation and so on. Some especially suited for making jellies.	Order Rosales. Family Rosaceae. More than 3200 species and about 115 genera in the family, with more than 400 species of *Rubus* known from North America. Important that herbarium specimens include samples of flowering and early canes for proper identification. This species known from Rhode Island, and close variety, *R. p. cordifrons*, known from Virginia.	Order Geraniales. Family Geraniaceae. Family includes 11 genera and some 640 species of which 230 are in the genus *Pelargonium*. Most of the species are native of South Africa and many are known as household "geraniums," or used on a worldwide basis as bedding plants both for the flowers and for the foliage.	Order Rhamnales. Family Vitaceae. There are more than 500 species in the family and over 10 genera. From the native *V. labruscana* have been developed such varieties as the Concord, Worden, Hartford and Vergennes grapes. Native grape known as fox grape. Catawba, Niagara and Isabella grapes developed from cross between *V. labrusca* and *V. vinifera*.
REPRODUCTION	Flowers borne on fruiting spurs and opening as the leaves develop. Sepals 5 and shorter than the 5 petals. Petals white or pink. Flowers fragrant with many stamens, to 3 inches across. Pollination by bees, or sometimes by flies, and necessary for development. Fruit maturing from early summer to late autumn depending on the variety. Propagation commonly	Flowers 1-4 with clusters of 3-4, in open clusters reaching to about same height as leaves. Flower stems stout, to more than 1 inch long, fuzzy. Fruit short, oblong to spherical, when mature, to 3/5-inch long, bearing the persistent calyx, which is fuzzy, with narrow lobes and narrow pointed tips. Calyx lobes about ½ the length of the matured fruit.	Flowers resemble pansies and are usually in large, showy clusters. Flowers are 2-3 inches across, usually with 5 petals that are flat or wavy margined. Flowers appear from June until frost time and because the plant is a hybrid seed are rarely set. Fruit splits into spirally curling, 1-seeded units at maturity. Common propagation is by cuttings.	Flowers appear about time leaves appear at base of current year's growth; like small greenish cups actually or functionally staminate or pistillate. Fruits are soft, blue, delicious, juicy berries with many seeds imbedded in a sweet juicy pulp. A vine may produce to 60 bunches weighing to 20 pounds. Usual pruning to 3-4 canes, with 8-10 buds each.
ECOLOGY AND ECONOMY	A major fruit of the United States, rich in vitamin B and C, storing at around freezing temperatures with high carbon dioxide in air helps sustain quality. Orchard may bear at 4 years and yield to 10 bushels a year by 10 years, and to 50 bushels per tree by maturity or 500 bushels per acre. Wood valuable for turning and for fuel.	Plant is found associated with bayberry and similar bushes and may rise to a point higher than these bushes so as to appear conspicuous. The dewberries belong to a section of the genus *Rubus*, known as the Flagillares, most of which typically take root at the tips in autumn but some that are prostrate and root at the joints. As a group long known as *Rubus canadensis*.	Requires soil high in phosphate and potash. When grown in beds common practice is to apply 20% superphosphate at 10 pounds and 1 pound potassium chloride to 100 square feet. Too much nitrogen makes plants too succulent. Plants may be cut back and used 3 winters. May be propagated by leaves as well as by stems. Overwatering, poor ventilation risky.	*V. labrusca* is native of North America and *V. vinifera* is native of Europe. Fruits are high in vitamins B and C. Yield may be as high as 5 tons to the acre. Fruits sold fresh for food or for juicing and fermented or unfermented into wine or juice. Wild grapes are of high value as food for wildlife, both birds and mammals.
L. H. BAILEY INTEREST	The apple tree was L. H. Bailey's favorite tree. At 12, he was in demand as a tree grafter. In 1885, he won his first and most prized medal for an exhibit of Michigan fruits and nuts. In 1886, he published his second book which was an orchardists' manual. In his 20s, he emphasized apple hybridization. In 1922, he wrote *The Apple Tree*, among his best literary works.	L. H. Bailey described this species as new in 1943. He became interested in the genus in his senior year in college while working on Michigan flora with Erwin Smith. Next to palms the genus became his major interest and from 1920-1950 he made 83 major Rubus-collecting expeditions all over the United States and during the War published *Rubus in North America*.	Plants are hybrids, first named by L. H. Bailey in 1901, though the plants have been popular garden plants since 1815. At least 7 species, involved in an obscure and complex ancestry. Much hybridization took place without explanatory records being kept. Introductions to Europe apparently are from South Africa, the native home of all of our pelargoniums.	L. H. Bailey gave the genus intensive study during the late nineties and at that time monographed the American native wild species. In 1944, he expanded these studies to include the cultivated forms closely related to *V. labrusca* but involving selections and back crosses of hybrids with the European *V. vinifera*.

HONAN HIBISCUS *Hibiscus paramutabilis*	REX BEGONIA *Begonia rex-cultorum*	WALL JASMINE *Jasminum absimile*	GOURD *Cucurbita pepo ovifera*	CANTERBURY BELL *Campanula medium*
Shrubby tree or small tree usually 14-20 feet tall, nearly as broad as high. Leaves are alternate, 5-lobed and somewhat like a maple, 4-6 inches broad and of about the same length and with bases appearing to be cut straight across but sometimes may be weakly heart-shaped. Stem relatively stout and straight, covered with short fuzzy substances.	The common rex begonia grown for its prized, variously colored, variously zoned and banded foliage. Leaves generally unlobed and leaf blade commonly *lacking* the metallic green color of *Begonia rex*, which is zoned with silver-gray midway between the margin and the center. No upright stem, with rootstock lying rather horizontally near ground surface.	This jasmine was described as new by L. H. Bailey in 1940. It is a smooth, evergreen climber. The stems are slender and woody. The leaves are green but not waxy, to 2½ inches long and half as broad as long, pointed at each end of blade and with relatively short petioles, with prominent midrib and obscure secondary ribs parallel to margin, with interlocking veins.	Long, slend[illegible] climbing or running [illegible]es bearing many te[illegible]. Leaves harsh, rough, prominently lobed, to 8 inches long or broad, being more deeply lobed or scalloped than those of the closely related pumpkin. Fruit stems are hard, angled and commonly enlarged where they join the fruit. The whole plant has a rather harsh feeling.	Height is to 4 feet. Stem is erect, relatively stout and strong, covered with fine hairs. Basal leaves are to 10 inches long, with long tapering petiole-like bases while the upper leaves are to 5 inches long and have clasping bases and wavy margins. Veins of the leaves are relatively conspicuous and the leaf margins have shallowly curved indentations.
Order Malvales. Family Malvaceae. Relatives in the genus include flower-of-an-hour, okra, roselle, rose-of-China, cotton-rose, rose-of-Sharon. Relatives in the family include cotton, flowering maple, marsh-mallow, rose-mallow, globe-mallow, checkerbloom, false-mallow, mallow, poppy-mallow and tree-mallow.	Order Violales. Family Begoniaceae. Related to the wild species from Assam which is little known in cultivation. This species possibly derived from the wild species *B. rex*. The related tuberous begonias are *B. tuberhybrida*. *B. rex-cultorum* is probably a group of begonias which could not survive except under cultivation conditions.	Order Gentianales. Family Oleaceae. Over 200 known species found in tropics and subtropical areas and in greenhouses around the world. This species is probably of Australian origin though may have come from Africa. They have been grouped, to include this species, as simple-leaved open panicled jasmines, with flowers in close clusters or heads. Six species in group.	Order Campanulales. Family Cucurbitaceae. Bailey lists 17 genera in the family with 9 listed in his *Garden of Gourds*. In the family are such common fruits as cucumbers, watermelons, squash, pumpkins, gherkins, cantaloupes and balsam-apples. The genus *Cucurbita* includes pumpkins, summer squashes, winter squashes and others of economic importance.	Order Campanulales. Family Campanulaceae. The family boasts some 1000 species and about 40 genera. The genus *Campanula* has some 250 species, largely northern and primarily European. Many are among the most popular garden flowers and of these Canterbury bells are frequently the most favored. Some 220 species or synonyms are listed as cultivated.
Flowers are typically white with a red "eye," about 3-4 inches across, with central, erect column, bearing many stamens near tip and enclosing usually 5 style branches, each with disc-like tip and emerging with maturity of flower. Petals 5, rounded at tip. Sepals 5, backed by 5 similar bracts. Fruit, a usually 5-partitioned capsule bearing black seeds.	Flowers are few, in loose clusters that reach beyond the leaves, are pale rose or pink, with 2 sepals that are colored like the petals but are narrower in the staminate flowers. Petals in staminate flowers 2; in pistillate, 2 or more and of the same size. Fruit, 2-3 celled, with wings and a twisted stigma.	Flowers are in clusters, in axils and at the ends of the stems, abundant, white, about 1 inch long. Calyx teeth are narrow and acute and about equal to the length of the calyx tube. Corolla lobes are narrow, acute or blunt and are shorter than the corolla tube. Flowers borne on relatively short stems in rather loose open clusters with corolla lobes separated, narrow, acute.	Broad striped gourd shown bears large, yellow flowers, which require sun for success. The fruit is hard-shelled, flattened endwise, sometimes being twice as wide as long, dark green and marked or streaked with greenish-white and is usually sunken at the point of attachment. Seeds are plain white and flat. Mature gourds have considerable ornamental value.	Flowers are borne on a long terminal stalk, singly, or in 2s along the stalk. Corolla is like an inflated bell or vase with tube to an inch across and lobes spread wide or backward. Colors are blue, white, violet, pink or other colors. Calyx lobes about ¼ length of corolla and fruit is a 5-celled capsule. Plants may be biennial or may flower possibly first season.
This species like many of its close relatives is grown as an ornamental in the United States and in Europe. It is hardy in southern New England if planted in a relatively protected spot and is fully hardy as far north as Philadelphia. Propagation is by seeds or by fall cuttings of ripened wood. Plants may be grafted relatively easily.	Requires moderate sunshine and does best at a temperature 60-70°F. with abundance or moderate amount of water applied to roots rather than to the leaves. Can be reproduced easily by cuttings of the leaves or other parts. Usually leaf is cut in two and stuck vertically into moist sand.	Plant has been grown under cultivation as *J. calcarium*, a species not known in cultivation in North America and it has been known under other names having been featured as *J. simplicifolium* as the frontispiece of the *National Horticultural Magazine*, Washington, D.C., in January 1938. It is known as the "wall jasmine" under cultivation in California.	Require abundance of moisture and sunlight during growing period. Seeds should not be planted before frost danger has passed. Some related gourds have such uses as the making of rattles, birdhouses and in one case the fibrous center may be used as a dish cloth or bath sponge, while it is edible in its younger stages if baked or boiled.	Common practice is to sow seeds indoors in early spring to transplant in May and get flowers in both of the first two years. Seedlings from summer plantings may be taken up in autumn and potted to produce flowers in the winter indoors. It is unfortunate that the plants are not perennial but they may be self seeding.
In 1917 L. H. Bailey made one of his most rigorous trips of 140 miles on foot and outside an ancient temple in Kuling, Honan Province, China, found this plant which is now accepted as an ornamental in North America and Europe. On this trip, Bailey suffered a near fatal attack of amoebic dysentery, wasted to a mere 90 pounds.	In 1923, L. H. Bailey first separated this from *Begonia rex*, which obviously was one of its parents but had leaves with the conspicuous silver-gray zone midway between the center and the outer margin. There are many fancy-named varieties common in American trade. While this group was not a Bailey specialty he described 6 species.	L. H. Bailey in 1940 described this species, which he recognized as new from materials under cultivation, as an ornamental from California. It is used as a hedge plant, as a wall cover, on trellises and as a general ornamental. Bailey recognized its differences in *Gentes Herbarum*, Volume IV, Fascicle IX, 1940, pp. 346-347.	Bailey had a long and strong interest in the group to which he gave the common name "cucurbits." He had a special interest in the cucurbits that were gourds when he wrote in 1937 the 134-page *The Garden of Gourds*, which was included in his "Garden of" series. It gives illustrations of more than thirty plants which he included as "gourds."	L. H. Bailey's interest in bellflowers began with love for those in his mother's garden and lasted through his life. They were always in his garden and he loved few more than these. His last book, published in 1953, was *The Garden of Bellflowers*, is a beautiful work of 155 pages, which is generally useful and expresses Bailey's varied abilities.

(*Continued from page 139*)

culture, which got its support from the taxpayers instead of from private university endowment.

In rapid succession the botanist-builder developed departments of plant pathology, plant breeding, and plant physiology, and started a new Department of Botany in the Agricultural College in 1913, at the time of his official retirement. During the summer of 1913, I made the first collections specifically for the new department, but chose to stay with the old department because my graduate work was nearing completion.

With his retirement from university administration Dr. Bailey returned with a new vigor to his beloved botany and began building his own herbarium of cultivated plants, preserving the seeds, immature plants, flowers, and fruiting stages, along with photographs of the plants in various stages of development. Study of these raised problems that called for extensive travel to the "ends of the earth." Eventually he accumulated some 33,000 specimens of *Rubus* material alone, with superior collections of other groups from New Zealand, China, the Americas, and Europe. These activities were not financed by the taxpayer but by returns from the books he had written, mostly for botanists and for those who raise plants on the land. This activity eventually found expression in the establishment of the Bailey Hortorium, where the major interest centers around the application of the principles of botany and related sciences to plants that have proved valuable under cultivation. Much of this interest centered around understanding genetic relationships.

LARKSPUR

APPLE

CABBAGE

Dr. Bailey was identified prominently with many professional organizations. He was the founder, first president or president of most of the substantial professional groups concerned with plant life. He was the first president of The American Nature Study Society, and president of such organizations as the American Association for the Advancement of Science, the Botanical Society of America, the American Pomological Society, the American Association of Agricultural Colleges and Experiment Stations, the American Country Life Association, and the founder and first president of the American Society for Horticultural Science. He also served as president of the American Society of Plant Taxonomists. Besides receiving important citations from professional groups in America, he received decorations from Venezuela, England, Scotland, Denmark, New Zealand, Ireland, Italy, France, and Japan, and from the International Botanical Congress. He was one of five founding members of the Botanical Society of America.

While he obviously appreciated these honors Dr. Bailey seemed equally pleased by the recognition given him by garden clubs, green thumb enthusiasts, 4-H Club groups; and he gave his country home along Cayuga Lake to the Girl Scouts.

The great botanist not only developed a literature in his chosen field, helped build professional organizations that contributed further to the development of these areas of interest and labored long and effectively in producing herbaria of significant dead specimens, but he believed thoroughly in the establishment of living plantations where interested researchers could study, first-hand, those plants that could survive in a given locality. To this end, he did much to sponsor the establishment of The Cornell Plantations, dedicated primarily to the study of living woody plants. He served for many years as its guiding genius. It was at a meeting of the governing board of this organization that I last saw him serve as a presiding officer. He stood erect through the meeting, brought up the problems that were scheduled for consideration in an orderly manner, disposed of them with dispatch and fairness, and left everyone satisfied that the time had been well spent. This was a refreshing experience in contrast with that common to so many university committee groups. To help advance the cause of the "Plantations," which name he selected for the organization, he encouraged the publication of the quarterly *The Cornell Plantations*, now in its fourteenth year. He wrote the foreword in the first number emphasizing the desirability of planning the use of the university holdings not only for buildings, farms and highways, but for living botanical collections chosen for their beauty, historical significance and instructional value and placed for convenient study.

Much as his pioneer father developed a home from the Michigan wilderness, Liberty Hyde Bailey pioneered in developing new areas of human interest, particularly in biological science and in social science. Before he was sixteen he wrote a paper on the value of birds to farmers, and presented a new viewpoint to a group whose interest centered on trees rather than on birds. This talk was given at the annual meeting of the State pomological society. For this young Bailey was named "ornithologist of this society" by his home group. The prize was a cage of three live English sparrows from New York to help save Michigan apples from insects. He freed them.

Through life L. H. Bailey continued these pioneering activities. As a student and staff member at Michigan State he broke with convention and brought faculty and students together to work on problems with real materials. At Harvard, he tried unsuccessfully to show Gray that a horticulturist should be a botanist, and that horticultural practice and botanical research should work together. When he came to Cornell he continued his pioneering activities, winning battles with the academicians and gradually getting agriculture to be recognized as a worthwhile academic discipline. When he became dean of the New York State College of Agriculture he took the reins and drove rapidly ahead, creating new areas of activity even if he had to coin new names to represent the area involved. His interest in genetics was often spectacular and always infectious. Other schools and other parts of the country followed his lead. The laws of genetics, applied to farm cattle, later yielded our Santa Gertrudis cattle, an accomplishment that was more important to human happiness than the development of a sputnik. Dr. Bailey did not, of course, participate directly in this project, but he did influence agricultural practices the world over.

At a meeting in East Lansing, Michigan, in 1907, the naturalist asked: "Is the farmer worse off than other classes of citizens? If so the remedy is not complaint or recrimination but an earnest, patient effort to undo the wrong." On the same program Theodore Roosevelt, whose centennial we also celebrate this year, said: "If there is one lesson taught by history it is that the permanent greatness of any State must ultimately depend more upon the character of its country people than upon anything else." A year later President Roosevelt appointed Bailey chairman of his Commission on Country Life "to survey the field of rural life and suggest means of correcting deficiencies." Roosevelt said at the time that—"With the single exception of conservation of our natural resources there is no other material of greater importance now before the American people." In part as a result of this survey, we today have a parcel post system that serves the rural citizen as well as the man who lives in the city. Similarly we have a national extension service, agricultural and home economics education, and rural electrification. The seeds for all of these worthy public services were discovered and sown by L. H. Bailey and Theodore Roosevelt, pioneers in discovering and exploring vigorously worthy new fields of interest.

There is reason to believe that when young Bailey was nineteen he drew up a general plan for his life. He allowed twenty-five years for training, a similar period for compensating service to others and asked that he be free for the rest of his life to live as he pleased. He spent each New Year's Day drawing up a check list of things to be accomplished during the coming year, posted this by his desk and meticulously checked off each as it fell before his efforts. Fortunately the habits formed in the first half-century of such a plan practically guaranteed that the rest of his life was to be most useful to society. Because of conditions that developed as he reached the half-century mark, he was 55 before he began what was probably the most significant and rewarding part of his life. Even after his official retirement at that time he planned rather meticulously what he would do. At the end of a day he planned what he hoped to accomplish on the next, and usually he did it. At the dinner given him commemorating his ninetieth birthday he told of projects he hoped to complete in the next two decades. He had not been able to have the dinner exactly on his ninetieth birthday because on that day, as he had planned, he was in the field collecting plants in the tropics.

Dr. Bailey's varied interests provided him with activities that were of recuperative value. It is quite probable that his successful efforts as a poet were produced during periods of reaction from serious experiences in life and this does not imply that his poetry was that of the dilettante. There would seem to be some significance in the titles of his publications that appeared after his retirement from university service. First appeared a revision of his *Botany for Secondary Schools*. This had appeared first in 1900. Then, in 1913 and 1915, came the two volumes of *New York State Rural Problems*. This was followed by *Ground Levels in Democracy*, and by his collected poems, which appeared under the title of *Wind and Weather*. Following this appeared what many thought represented his best presentation of his philosophy, *The Holy Earth*. This was written on shipboard while on his way to New Zealand to collect plants. This book represented some of his finest prose, was based in part on ideas developed when he wrote in the "leaflets" for children of New York State. It was the first of a series of books that were dedicated to a philosophy of service to man. The series included such titles as *What is Democracy?*, *Universal Service*, the *Hope of Humanity*, and others. Bailey felt that *The Holy Earth* probably best expressed his philosophy of life, and was greatly pleased when, twenty-five years after its first appearance and after the end of the World War II, it suddenly came again into great demand.

We might sum up our story by saying that Liberty Hyde Bailey was a scholar with a human touch, an individualist with the ability to enlist the wholehearted support of others, a practical down-to-earth man who enjoyed journeys into the world of fantasy and beauty, a rugged scientist who could bring out of others the best they had to offer, and a dreamer with desire and ability to make most of his dreams come true.

TO A SPIDER

By Eddie W. Wilson

Loving the beauty wrought in flounce of Brussels lace
I leave your web upon my porch intact.

Out in the field, "Cap'n Bill" Vinal, at the left, kneels as he explains to one of the classes at the Alvord Wildlife Sanctuary why an orchid is growing in this particular locality, and how it is inter-related to nearby plants.

Island of New Ideas

WEARING A MANTLE of trees and a skirt of pebbly beach, Bear Island lies like a lop-sided hourglass in the brilliantly blue waters of Lake Winnipesaukee, New Hampshire's largest lake. Like many New England localities, it has an interesting past, but, unlike some of these places, it also holds an intriguing future.

What is this "intriguing future?" It is based upon a significant concept in the field of conservation education—a concept which, as seen in action at the Alvord Wildlife Sanctuary on Bear Island, seems destined to dredge some deep channels of new thinking in conservation teaching philosophies. It concerns the interrelationship of man, plants, and animals—certainly not in itself new thinking—but singular in its application at Alvord.

The underlying philosophy of this concept has its birthplace in Albert Schweitzer's "Reverence for Life" theme, which holds that the ultimate well-being of the living, natural community is also the ultimate well-being of the human community.

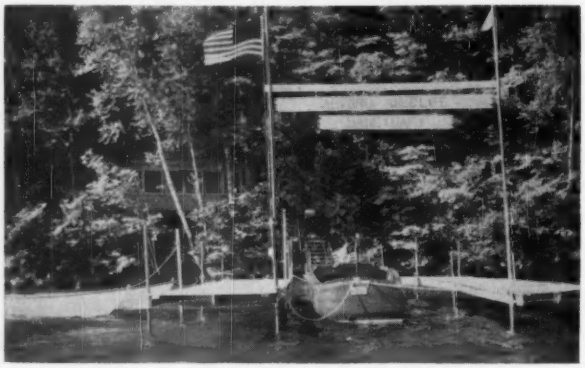
Perhaps this "new look" in education can best be explained in the words of its originator, thirty-eight-year-old Lester A. Giles, Jr., Director of Alvord.

"When I was teaching high school biology, back in 1950," explains Les, "I first realized the need for effective teaching in conservation. The way things stood, there never seemed to be room at the curricular inn for the subject, and I blame this on the lack of outdoor education in the teaching staff. I believe this lack further hindered the subject's chances, because people are often afraid of things they don't fully understand.

"Since I was already deeply interested in conservation teaching, I tried to come up with a way of filling this need—a way which, at the same time, would be based upon a truly comprehensive approach.

"You see, many conservation workshops deal with their subjects from a departmentalized viewpoint. This is to say that soil, water, plants, animals, and sometimes weather, are treated as individual studies. I wanted to give students the *whole* picture of a community of *inter-related* things—especially living things—to show

The gateway to Alvord Wildlife Sanctuary on Bear Island, in New Hampshire's Lake Winnipesaukee, is this U-shaped dock, where the Sanctuary's 22-foot sea skiff is tied up.



them that the existence of man on earth is one of complete dependence on other forms of life, without which he would simply cease to exist.

"Four prime objectives were established. First, we wanted to assist students in developing skills of observation, evaluation, and appreciation of natural resources, especially living resources. Next our aim was to encourage a personal philosophy of conservation and incorporate it into a teaching program. Third, there was need of aid in developing a program of instruction that integrates a conservation attitude into the existing curriculum in accord with the school's educational objectives. Finally, we sought to encourage humane attitudes toward all living things, and a deeper appreciation of their importance to human welfare, especially the complex inter-relatedness of all life.

"Thus, such a teaching method would involve not only the acquisition of new skills and a fresh philosophy, it would ultimately demand the ability to make a *far-*

An exterior view of the Sanctuary's largest single building—Sewall Lodge—shows the sturdy construction typical of all the buildings.

By ALDEN S. WOOD

Photographs by Lester A. Giles, Jr.

reaching interpretation of the dynamic biologic community at hand."

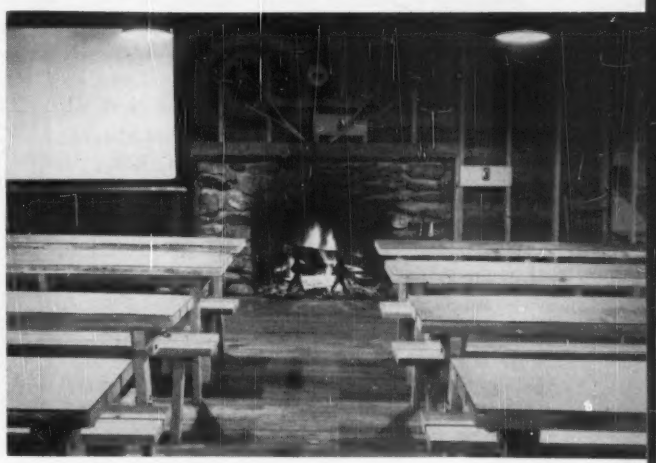
After laying his groundwork, Lester Giles took his idea to Dr. Eric H. Hansen, president of the American Humane Education Society and the Massachusetts Society for the Prevention of Cruelty to Animals. Dr. Hansen liked what he heard, and it was decided to establish the school in an area that could also serve as a wildlife sanctuary, and have the outdoor resources needed for teaching purposes.

Several sites were surveyed, and eventually the 242-acre tract on Bear Island was selected as being ideal. The Sanctuary was financed by the Mary Mitchell Humane Fund (of which Dr. Hansen is the trustee), and named after Miss Muriel Alvord (now Mrs. F. P. Ward, of Hartford, Conn.), whose generous donation to the Mitchell Fund was instrumental in establishing it.

On my visit to Alvord, I saw at first hand how perfectly it lent itself to the new teaching philosophy. As Les swung the Sanctuary's twenty-two-foot power launch towards the dock, after the quarter-mile cruise from the mainland, all the verdant glory of a climax forest rose above us, dwarfing the neat, compact camp buildings clustered near the water's edge.

As we tied up, Les told me that nearly all natural habitats occurring in New England (except seashore) exist on the island. There is the climax forest, or deep woods; open fields; fields invaded by pioneer growth; the lake; plus all stages between pioneer and climax stands of woods. In the forest are ironwoods, yellow,

Alvord's advisory committee sits to discuss a new teaching technique. From left to right, Dr. William E. Randall, Jr.; Dr. Charles Kinney; Dr. William G. Vinal; Lester A. Giles, Jr., and Richard W. Westwood. Below, Sewall Lodge serves both as large classroom, and spacious dining hall.



All ages listen closely as an Alvord instructor makes a vital point in his explanation of the inter-relationships between the human community and its natural surroundings.

black, and white birch, beech, maple, ash, cherry, oak, hemlock, white pine, and witch-hazel trees. There are native orchids and ferns (including three rare grape ferns) in profusion. On the rock outcroppings can be seen clear indications of three earlier lake levels, as well as a prominent fault that bisects the island.

Les calls the bird population "terrific." Grebes, ducks, loons, kingfishers, and scarlet tanagers are numerous, and many migrations are recorded in season. The animal inhabitants are, in part, raccoons, skunks, shrews, mice, red squirrels, 200 head of deer, fox, and mink, as well as milk snakes, striped adders, and DeKay's snake.

While Les and I toured the eleven buildings that make up the camp area, he told me about the different people who have attended the conservation courses, and what they had said about the Sanctuary as a whole.

Following Alvord's opening on July 29, 1956, one of the first groups to enroll was from the Appalachian Mountain Club. Twenty-two men and women wanted an informal course in conservation, where they could learn how to use their eyes and ears, their powers of deduction, and also how to teach others what they had learned. They departed with nothing but praise for Alvord and its philosophy.

Mrs. Rena Aiken, a teacher in the Seattle public school system, works with special students. Having no background in biology, she took first the basic, two-week "Conservation Education Workshop"—and was so pleased with what she learned that she returned later for the "Advanced C.E. Course," also two weeks long.

Students from Massachusetts' Springfield College studied at Alvord, because they thought this specialized education would aid their future—as also did some ladies from the Boston Teachers' College. Others are a librarian from Rhode Island, a school principal from Natick, Mass., and a member of the staff of the Children's Museum, in Jacksonville, Florida. Perhaps the most succinct comment was given me direct, by a student in attendance during my visit. Said Carolyn Woodbury, teacher of the fourth grade in Wellesley's Warren Elementary School, "It's a crime this hasn't been done before!"

Sharing the delightful wilderness of Bear Island with Alvord are two private camps that profit from the Sanctuary's proximity. Alvord students often take groups of camp youngsters on Nature trips, thus spreading the conservation philosophy *and* gaining teaching experience themselves! Understanding the outdoors is seldom beyond the ken of any age group—Alvord students have ranged from age fifteen to more than sixty. And those at the college level are happy to learn that transferrable graduate and under-graduate credits for the academic courses are available through New Hampshire's Plymouth Teachers' College.

Our tour completed, Lester Giles and I sat down to a welcome cup of tea in his lakefront cottage.

"Les," I asked, "tell me just how the teaching here differs from, shall I say, 'standard' processes, with regard to conservation."

"Well," he replied slowly, "it goes like this. We teach our students to 'read' Nature in the field rather than in a book. Anyone with average intelligence and five senses can find the answers. It's the same idea as seeing what a deer does rather than what he is *supposed* to do as outlined in a book.

"If the eye is trained to experience these things in the

At Alvord, there are opportunities to study botanical "succession," the recapture of the land by forest growth. In the forest-to-farm-to-forest cycle, pioneer growths like sumac and gray birch gradually encroach on orchard and meadow, to be followed by white birch and white pine. To the right of the white birch can be seen the twisted form of a dead apple tree, choked by invading forest growth.

The attendance for the dedication ceremonies on opening day, July 29, 1956, overflowed spacious Sewall Lodge. The attentive group covered a wide span of ages.

form of print only, then the whole organism tends to shun reality because it is unfamiliar, untrained, and unappreciative.

"We avoid this negative aspect here. As confidence is gained in using the senses and powers of deduction, the horizon widens, as reality becomes familiar. The student soon begins to see more easily the interrelatedness of the living community, what has gone before, what will probably come afterwards, and man's relationship to the whole.

"Once these things are established, the next step is for the student to design his own Nature problems, using the Sanctuary's resources. Thus, he has learned a new technique of outdoor conservation education—one which he can take back with him and use in his own community."

Les went on to outline some of the basic problems that are put before the students. An instructor in the field will point to a tree and ask his class:

"What made that hole in the tree. . .and why?"

The alert student would say, "A woodpecker, probably looking for grubs."

"And," pursues the teacher, "was this a success?"

The answer should be "yes," since the tree trunk is pocked with earlier holes that are partially or completely healed; a sure indication that the grub population has been markedly decreased. . . .and the woodpecker's appetite sated.

Here is a perfect example, right on Bear Island, of the inter-relationship between weather, trees, plants, animals, and man. The instructor takes his class to a wooded area, where a score of trees were felled during a hurricane several years ago. Their falling opened a large gap in the forest canopy, and allowed the sun to stream down to the forest floor. This significant event triggered the growth of the lush grasses and brush seen sprouting up all around the decaying tree trunks. And this, in turn, soon attracted hungry deer! The presence of many deer (in years past) has been ample reason for man establishing his own community nearby.

Indeed, on more than one field trip, Les reports the classes were enthralled to see, with their own eyes, a doe grazing peacefully in the midst of just such a windfall.

Because of weather's effect on plants, animals, and man (as seen above, for example), the Sanctuary maintains its own complete weather station, where classes study the hygrometer, barometer, maximum and minimum thermometers, anemometer, rain gauge, wind direction indicator, and weather maps. Alvord makes its own daily predictions—flies storm warnings, when needed, for local water traffic.

This close, personal contact with Nature, through the instruments that test its pulse, brings home a fuller realization of the role played by climate and weather in shaping the destinies of any natural community.

A typical New England phenomenon—the cycle of forest-to-farm-to-forest—is clearly visible at Alvord. It is "read" through the old cellar holes, tumble-down buildings, wood piles, paths, wagon trails, and well-holes found in the interior. Bear Island once supported three dairy farms, as well as one of the first resort hotels, the Bear Island House, in New Hampshire. High expenses and sub-marginal soil caused their failure. Today, a pioneer forest of sumac and gray birch is inexorably invading the area, and choking out "foreign" growths (apple trees, for example) introduced by man years ago.

Other student activities concern the use of audio-visual materials, to aid in acquiring skills of observation and perception; discussions, lectures, and seminars; the use of field-collected data and materials; direct observation of animals and their signs; electric Nature games; study of beehive, ant colony, and terrarium; and field trip planning.

"It pretty much boils down to this," Mr. Giles declared, "We provide students with outdoor experiences—take them out and *show* them things. We teach them perception and awareness of things books merely talk about.

"Our most important job is to point out both simple and complex inter-relationships and from these, promote formation of concepts, attitudes, and appreciation that, in turn, provide the student with a deeper, richer philosophy of outdoor living. Too often, I repeat, the realization of man's utter dependence upon other forms of life is overlooked by the average person."

Illustrating this last point, to a degree, is a story concerning some Colorado stockmen, whose herds of cattle were plagued by coyotes. The losses were not catastrophic, but troublesome; so the men set out poisoned bait. Their method was a complete success, but with a disastrous backfire! Within a few years, the jackrabbit population, formerly kept down by the coyotes, overran the ranges, and left no fodder for the cattle to eat. Man, suffering from conservation myopia, never dreamed that the coyote could be a greater friend than enemy. (*continued on page 159*)

Nah-tuk

By PATRICIA MAY MILLER

Photographs by the Author

This youngster is Nah-tuk, an Arctic horned owl, photographed in June, 1956, shortly after it had joined the household.

By September, 1956, Nah-tuk had become a mature bird, and had acquired the ear-tufts that enhanced its scholarly appearance.

We had been thinking seriously of acquiring a dog or a cat as a pet. However, when someone offered us a baby owl, we had to think twice before accepting it. It was no ordinary owl, either. For, you see, we live in the Arctic, in the Eskimo village of Noorvik, Alaska; and the baby owl happened to be an Arctic horned owl. After a discussion of the advisability of having such a bird, it was decided that the offer would be accepted. An owl not only would be an unusual kind of pet, but should also prove interesting to watch, as it grew and developed.

A young Eskimo man had gone hunting, and had come across an owl's nest. He had killed the mother owl, and had brought the two baby owls back to the village, where the Eskimo had kept one of them for his own, and had given the other to an Eskimo mother with five young children. The children were so frightened by the baby owl's sharp beak and claws, and the way it clacked at them, that the poor mother, in despair, asked us if we would not like to have it!

My husband quickly built a small pen for the new arrival. As soon as the pen was finished, the "baby" was brought—and what a sizeable baby! We realized immediately that the pen was far too small, and the poor owl was bumping its head on the top. Only a year ago, we had come from California, where we had been familiar with barn owls; so the size of our new pet rather astounded us. It was the last part of the month of May when we got our pet, and the young owl still had its baby-down, with only a few feathers starting to grow.

Our next problem was to find a name for the new acquisition. What kind of name does one give a baby owl? We finally asked an Eskimo girl what the Eskimo word for owl was, and she said "Nah-tuk"—so there was our name!

Having fixed a pen and given our new pet a name, the next thing to do was to feed it. The Eskimo had told us that fresh meat of any sort was what the owl liked. We gave it some caribou liver, but the owl refused to touch it. Thinking it was a matter of adjustment to a new environment, we did not worry about Nah-tuk's failure to eat. But, after two days had passed, and the owl still would not eat, we became concerned. My husband decided something had to be done; so, donning canvas gloves for protection against sharp beak and claws, he proceeded to play nursemaid to Nah-tuk. By

placing bits of meat in the owl's mouth, Nah-tuk proved to have a good appetite, indeed. In our ignorance, we had assumed that our pet was big enough to feed itself. Apparently it was still being fed by the mother when captured, and had not learned to feed itself. In a week or so, Nah-tuk was enjoying many kinds of meat—caribou, both cooked and raw fish, and goose, to mention only a few. Since fish is the most plentiful kind of meat during the spring and summer in the Arctic, Nah-tuk's diet consisted mostly of fish.

About five days after we got the owl, little fluffs of feathers developed on each side of its head, indicating that, later on, Nah-tuk would have the nice ear-tufts that give this owl such a striking appearance.

The nocturnal habits of Nah-tuk were rather disrupted during the Arctic summer, when there is daylight around the clock. However, Nah-tuk developed the habit of whistling for us at about ten o'clock every night, letting us know that it was time for food. We never ceased to enjoy watching our bird, and often its antics would keep us laughing. The neck was so flexible that the bird could turn its head around with ease, and face backwards, looking for all the world like a freak of Nature.

About three weeks after we got Nah-tuk, we started letting the owl out of its cage for two or three hours each day. After four or five days of such periods of freedom, Nah-tuk began to attempt short flights. Then, one evening, we looked for the owl, and it was gone. On the fourth day after its disappearance, we saw a big bird flying into a nearby spruce tree. Excitedly, I pointed it out to my husband, and he immediately hurried to the tree to see if it could be our Nah-tuk. It was; and we were happy to have our pet back once again.

We put Nah-tuk in the pen, and placed some meat within. After the owl had finished eating, we took some pictures of it, banded it, and released it to freedom. The bird flew up to its favorite perch on our cache—a small building, high off the ground, in which dried fish is stored—and stayed there all night, and part of the next day. After release, Nah-tuk came back for many visits, and always chirped and begged for food.

In early July, we had a rather hard rainstorm. While it was still raining, some Eskimo children knocked on our door, and in their hands was a thoroughly drenched Nah-tuk. The children had found the owl, and they must have thought that our pet needed some help. So they brought it to us, and what a sad looking bird it was! We put the owl in a small box in our kitchen, where it was warm. After eating some fish, Nah-tuk seemed quite content to stay in the box and dry off. By morning, the bird was dry, and looking like its old self again, so we let it go.

Once Nah-tuk came to visit us while we were in our kitchen, fixing supper. The owl perched on a ladder, outside the kitchen window, and cheeped at us each time it saw us, stretching its neck around as it cheeped. During such visits, we fed the owl different kinds of meat, and soon it became quite a beggar. I remember, one time, when we fed Nah-tuk some cooked fish, that the bird ate it all up and begged for more. We then gave it some trimmings from a fresh fish, which were eaten with great relish, and Nah-tuk continued to beg for more. So we topped the meal off with some dried fish, and Nah-tuk gobbled that down, too.

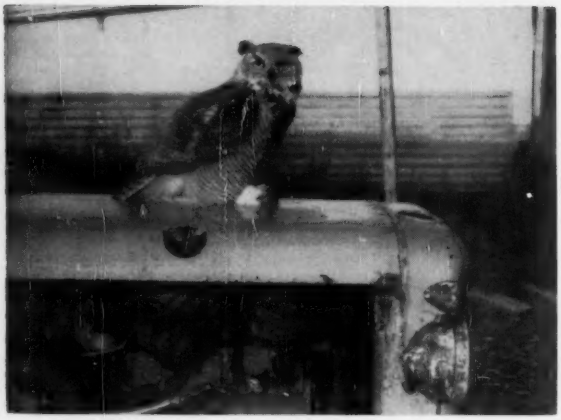
By fall, Nah-tuks' ear-tufts had developed so that the bird looked like a mature Arctic horned owl. On one of Nah-tuk's visits, our three-year-old daughter, Peggy, was playing outside, working industriously making mud-pies. Nah-tuk was perched on the front of our cache, watching intently and stretching its neck as Peggy busily played at cooking. Finally, Peggy finished her play, and came into the house. The minute she left, Nah-tuk flew down from the perch, and carefully investigated the child's activities. No doubt our pet thought

Peggy, the author's daughter, poses with Nah-tuk, while Mr. Miller holds the owl's legs as a precautionary measure.

that real food was being used by our daughter, and the bird was just curious enough to find out if there might have been any left.

During the first part of September, Nah-tuk paid us frequent visits, mostly in the morning. The owl liked to eat any left-over meats, and seemed to enjoy luncheon-meat and weiners, along with a diet of fish.

One morning, in September, Nah-tuk perched on our fuel-oil tank, to clean thoroughly and dig under its



It might appear that Nah-tuk is getting ready to do some repair work on the family snow-jeep. However, the bird's attention actually is on the piece of meat that it is holding in its claws.

feathers. When the bird had finished, the oil tank had a layer of white, scaly substance on it. After the clean-up job, the bird went to sleep for a while, looking very much like the pictures of sleeping owls so often seen in children's books. Our two daughters were playing in a room adjoining the porch; and after a while, Nah-tuk awakened and listened—the pet could hear our daughters' voices. Soon, I noticed that Nah-tuk was gone from the perch on the oil tank. It had flown through the open door into the porch, and was sitting on a table, watching our girls through a doorway as they played. As I went out to the porch to see what the owl was doing, the squeaking of the back door frightened it, and it flew to what it considered a safer perch on our cache.

In the middle of September, Nah-tuk stopped visiting us. The bird had developed into maturity during the summer months. Now the weather was turning cool, with frost at night, so we felt that our pet had probably headed south, to find a warmer climate. We surely hope Nah-tuk will visit us again, this coming spring, and that we will become friends again.

The Silent Partners

By PAUL MASON TILDEN

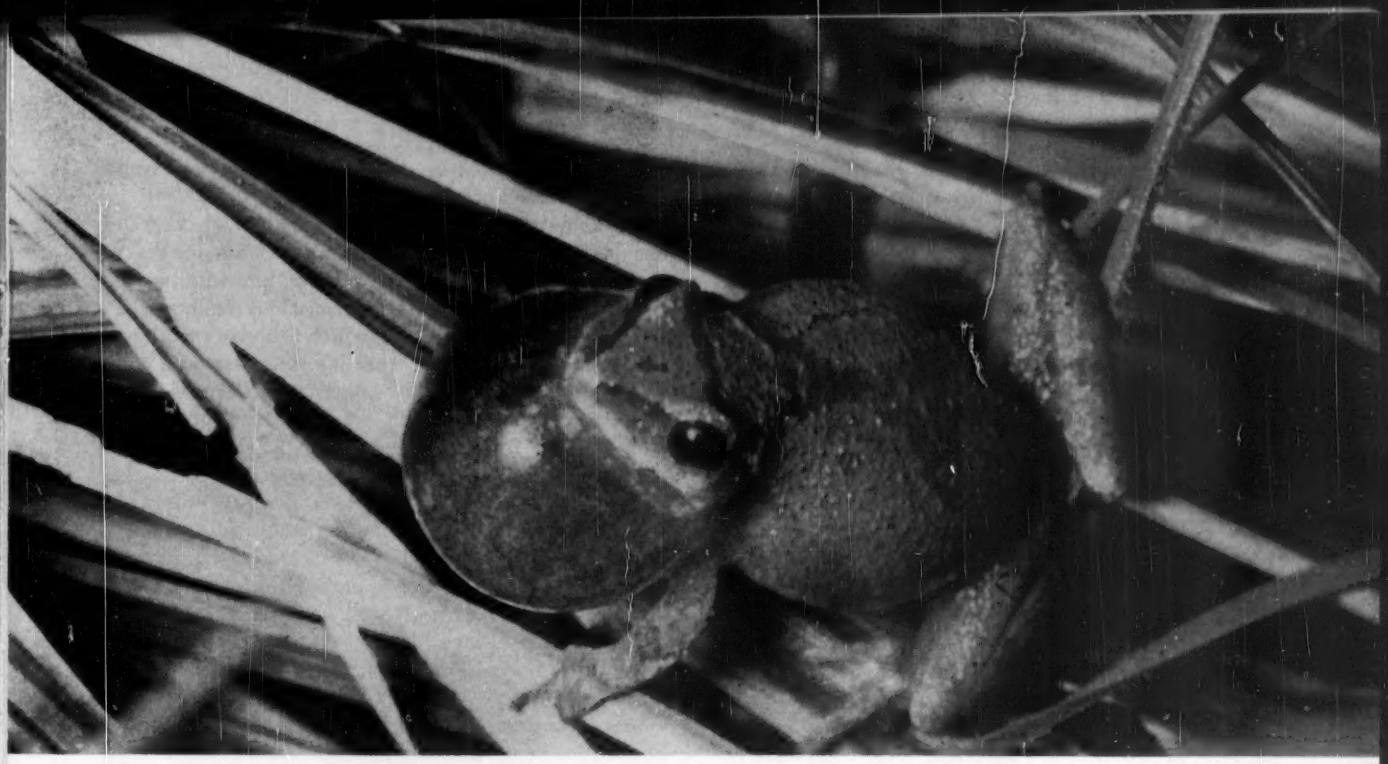
United States Forest Service Photograph

PARTNERSHIPS among men are common. Probably they have been forming and dissolving since the dwellers of the caves of Dordogne sketched classic pictures on limestone walls with natural pigments—and perhaps even before *that*. Where humans are concerned, partnerships are easily made and just as easily broken; but when two members of the plant world decide to associate, the partnership is likely to be something more substantial.

On our own Pacific coast there is such a natural partnership. It was entered into by two of Nature's plant-citizens, and it has lasted for at least a million years. One of the partners is a king, the other a humble retainer; but fossil evidence suggests that the fragile little plant called the sugar-scoop, growing by the acre on the half-lighted floor of the groves of coastal redwoods, has been a constant companion of *Sequoia sempervirens* since the chill of the Age of Ice extinguished the widespread redwood empire and left its remnant to a last stand in the mountains and valleys of northern and central California.

Outside the groves, in the sun and wind of grassland, bright colonies of flowers, tracing their ancestry through an entirely different lineage, seem to speak in terms of the Present. But the tiny white flowers and thready stems of dainty *Tiarella*, under the canopy of their mighty brown companions, speak softly, but unmistakably, of the Past.

The delicate sugar-scoop, *Tiarella unifoliata*, member of the saxifrage family, has been associated with a giant companion for at least a million years.



PHOTOGRAPH BY C. J. STINE

In the eastern portion of the United States, the call of the peeper is a sure sign of approaching spring.

There is friendly rivalry in

Frog Hunting—Family Style

By DOROTHY ROBY SCHNEIDER

Photographs by Stephen Phillips unless otherwise credited.

A NEW SPORT has swamped our neighborhood—or, perhaps to state the case more accurately, our neighborhood seems to have taken to the swamps. But the fact that the woodland swamps are, at this season, flooded by over-full brooks, and are alive with the calls of mysterious, hidden creatures, only partly explains the sudden enthusiasm for the practise of wading after dark.

Another instinct seems equally responsible for turning mothers, fathers, and children into silent night hunters. It is commonly known as the sporting instinct, and it is, specifically, an inherent competition between neighbors that has transformed us into formless beings in the darkness, whose presence is betrayed only by scattered spots of light moving back and forth across the swamp. Our neighborhood is spread out over a choice couple of square miles in western Massachusetts, and consists of only a half-dozen families. However, it is imbued with the same spirit of friendly rivalry that exists among those who, in urban areas, share the same sidewalk.

As the search for swamp life gets under way, the men demonstrate how they catch the big ones.

Now, in some neighborhoods, this rivalry is apparent in the thinly veiled competition of seeing who can devise the most exotic shade of paint for trim and shutters, or seeing whose lawn is most neatly pared around the edges, or maybe to discover who is first to install an automatic garage door. But for us, prestige accrues to him whose peas and corn ripen earliest, whose red maples turn reddest in the fall, or who can say with elaborate carelessness, "A big buck came down off the mountain this morning, and ambled up to the kitchen window as if he were looking for an invitation to breakfast." Among the youngsters, it is more likely to be a question of whose pond attracts the blue heron, or whose sandy bank yields the biggest crop of ant lions, or through whose grass travel the most various snakes.

What could all this possibly prove but that Nature, in her indisputable impartiality, has singled out this particular field and stream and mountainside as the most desirable for miles around? The owner is, of course, already convinced of that fact. It is also a subtle declaration of the skill of the observer, or his prowess as a capturer of wildlife—a status that must constantly be defended, if one is to maintain one's chosen role of backwoodsman. Thus, if called to the phone by a neighbor who announces: "Four purple finches are at our feeding station," one is thankful if he can (after polite congratulations) counter with the casual mention of the flock of white-crowned sparrows that arrived at his house yesterday, or the huge flight of redpolls that is, at the very moment, feeding in the tops of his birch trees.

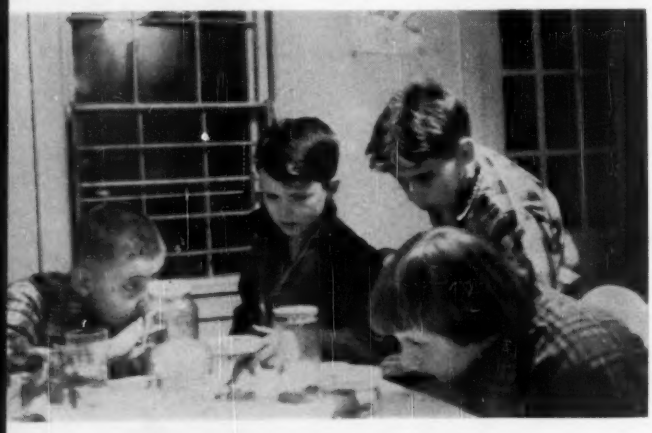
Of all the honored positions of the year, the one most coveted is that of the family who can say, "We heard the peepers last night!"

For the past few years, some of us have not been content just to listen to the chorus, the volume of which increases each night. Whetted by reading, here and there, about how infrequently most people see the members of this clannish choir, we have nursed the desire to capture the singer. Each spring, we have again gotten out our amphibian and reptile books, refreshed our recollections of the appearance and habits of Pickering's hyla—tiniest and most elusive of the tree frogs—and have noted that he *has* been seen by those who follow the sound of his singing.

We know that he is from three-quarters to one and one-quarter inches long; that he has little suction disks on his toes that make it possible for him to cling to tree trunks; that he has a tremendous balloon-like membrane beneath his throat, which he inflates when he sounds his stirring chirp; that his skin is smooth and changes color to match his background. But this little fellow's mark of distinction, which perhaps more than anything else accounts for the compulsion to see him, is the symbolic sign that he wears on his back. It would seem that he personifies all the newly awakened life of springtime, for he announces with a ringing note of joy that he has emerged from his winter's burial, beneath leaves and moss and snow, and on his back he carries a cross.

Unobtrusively, some of us have hunted him each spring. We have searched the twigs and tree trunks where the pictures in all the books show him perched. Going toward the sound of his voice is easy, but somehow all the noises that night creatures make have a way of ceasing abruptly, the moment one arrives where the voice ought to be. So each spring has gone by until the consuming activities of summer override our waning efforts, and each following spring they have been briefly renewed, to no avail. This year there came an

As a rule, no one returned from the frog hunt empty-handed. In the above photograph, two of the young hunters dump a batch of frogs' eggs into their bucket.



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The frogs behaved admirably after they were brought into the house, and the children vied with one another for the most advantageous position over jars on the kitchen table.

A frog in a child's hand is worth several sitting in the swamp, and all hands were pleased when the captives broke into song. In spite of a rather rough appearance, the frogs proved to be nothing but "old softies."

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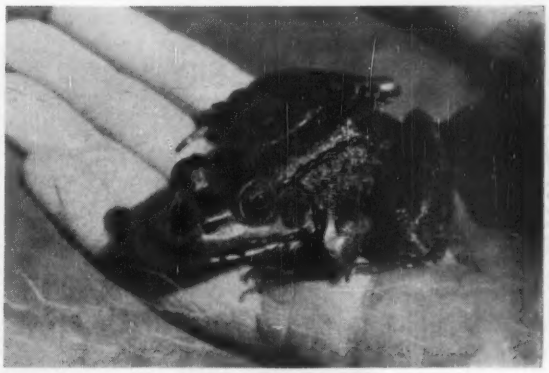
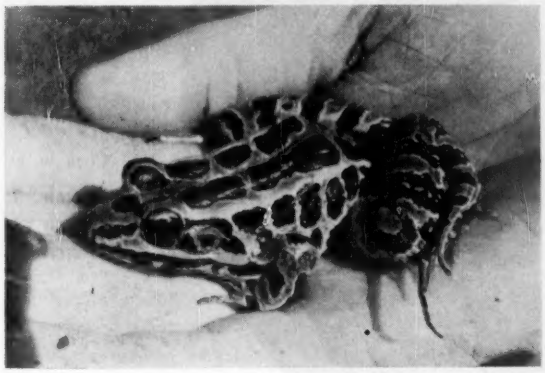


The frog hunters had no trouble in identifying the pickerel frog, also known as the tiger, leopard, or cold swamp frog, inhabitant of quiet ponds and cold streams.



end to the casual approach of the preceding spring-times.

It happened one evening at dusk, with the shrilling of our family's one-long-and-two-shorts on our eight-party line, and the excited voice over the phone of the thirteen-year-old son of a neighbor, a mile down the road.

"I've got one! I've got one! Right here in my hand. A tree frog!" He was shrieking. "I was standing in the grass up at the top of the pond. . ." But the rest of his conversation was a wild, garbled tale, and before he was half through it, the elder of our own two young sons had grabbed his flashlight, put on his boots, and was out the door, headed for the swamp.

We already had spent two or three evenings down there and seen nothing, but here was proof that the tree frog *could* be caught. There were two more 'phone calls in the next five minutes. One was to tell us to come on down and he would show us just where and how to catch one. Well, we should think not! A peeper from somebody else's swamp would not be nearly as sweet. The second call was to say, with all the joyful tenderness of a mother at her child's first spoken word, "He's singing! I'll hold him up. Now, listen." And, sure enough, we could hear him over the 'phone.

Spurred on by all this evidence that Pickering's hyla was not just "one for the book," our Bink shortly captured one. He brought it in the kitchen, to get a close look. Well, he thought it was a tree frog. It was tiny enough, but it was not the right color. It was nearly black, all over. No cross to be seen. It must be something else. We would have to take it down to Steve's house, to compare it with the one that he had captured.

Off we went to the neighbor's, the frog in a jar with a little water and some grass from the field. There, the heads of two younger brothers vied with the heads of the older boys for the most advantageous spot over the jars on the kitchen table, while their parents, no less curious and only slightly more restrained, craned their necks above them. Steve, by now an accomplished collector, had three frogs in his jar.

"Say," he said, examining Bink's jar, "I thought you said yours was different. He's just like mine. Look."

And so he was. Bink's frog was now as pale brown as the swamp grass in which it sat, and the dark brown cross showed plainly on its back. And, with that, he obligingly puffed out his sounding-sac, and began to sing. It was an exciting night, one that ended with the swamp song being rendered throughout the night from the bedsides of four boys.

Strangely enough, it developed, as we told other neighbors about our peepers, that none of these country dwellers had ever seen the owner of this, the most stirring voice of springtime, to say nothing of catching one in the hand. Not realizing how great the interest in them would be, we had let ours go back to their puddles in the swamp before anyone else had seen them. Apparently, this left at least one other family with the irresistible urge to explore our swamp for themselves. We were not able to prove this, but the next night we saw furtive lights down below the house, and went out to investigate; whereupon we were confronted by only the blackness of a misty, overcast night. We *did* see a fleeting flash of light, disappearing behind a rock at the top of a rise beyond the swamp.

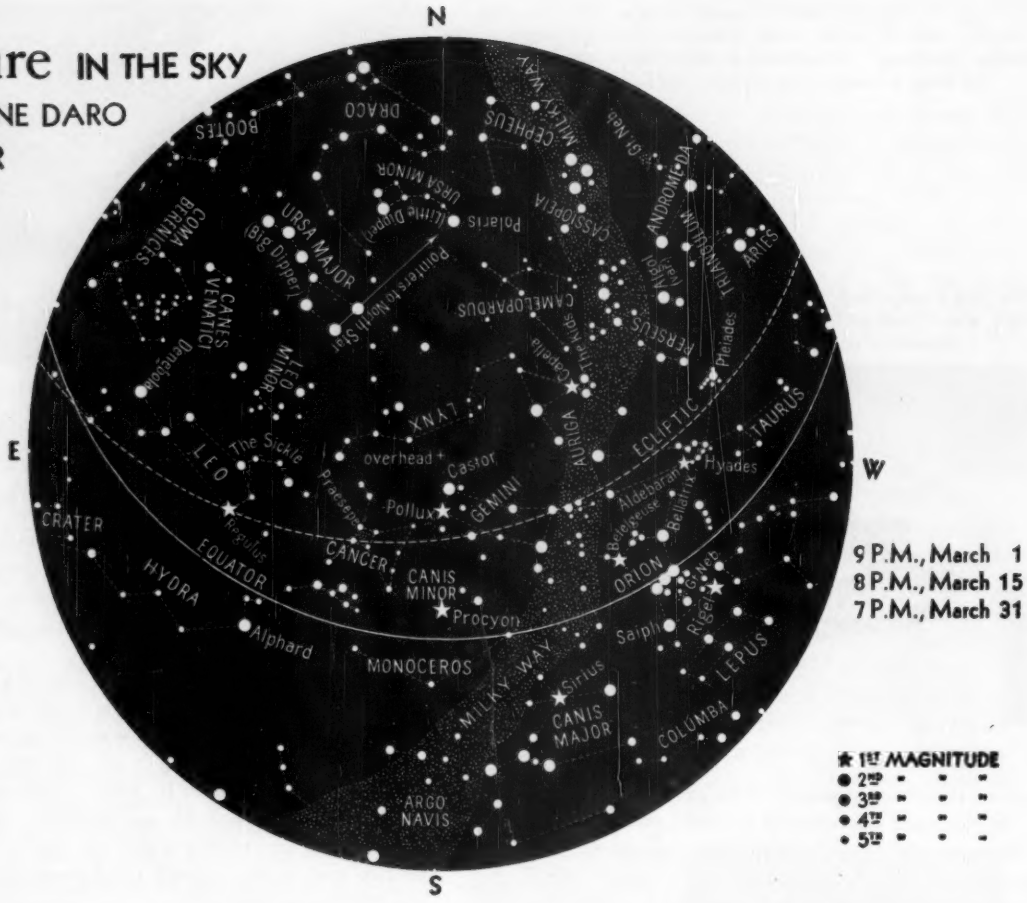
Not wishing to embarrass the suspected poachers, we decided to make a magnanimous gesture; we called them up, and invited them to a swamp hunting party. They accepted with alacrity. "Saturday night, soon as it's dark. . .Oh, sure, refreshments after the hunt, of course."

Our guests arrived, dressed as if they had planned to invade Okefenokee swamp. Waterproof hats and coats, high rubber boots, nets and pails, as well as lanterns.

"All you need is an empty peanut butter jar with holes punched in the lid," we told them. (*continued on page 164*)

Nature IN THE SKY

By SIMONE DARO GOSSNER



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then, below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. Times given are for Local Standard Time.

Sunrise and Popular Concepts

THE SUN does not always rise when you think it should. For example, it is understood that days begin to get longer as soon as the winter solstice is past, but, contrary to what you might reasonably expect, the sun keeps on rising later every day for several weeks.

Here is another confusing instance: The dictionary tells us that the word equinox (referring to the first day of spring or autumn) is a Latin word meaning "equal night," because on those dates day and night have the same length. Yet, if you look up the times of sunrise and sunset on March 21 and September 23, you find that the length of the day is twelve hours and about seven minutes, exceeding the length of the night by a quarter of an hour.

That is not all. If you find yourself north of the Arctic Circle, you may, of course, expect some very short days in late autumn and early spring. But, once in a while, you may be shocked to read in the almanac that the sun was supposed to have risen on a certain date when, in fact, it did not even peep over the horizon.

The last two of these anomalies are the direct consequence of the adopted definition of sunrise. Astronomically, sunrise is defined as the time at which the upper edge of the sun appears on the horizon, under normal conditions of refraction.

Refraction of the sun's rays by the atmosphere of the earth causes these rays to travel in a curved path. As a result, the sun appears higher than it really is. In particular, when we see the sun rise, it is in reality still a little below the horizon. This phenomenon is the

same as that which is commonly known as the mirage.

Data of observation indicate that, under normal conditions, refraction at the horizon amounts to 34 minutes of arc. In other words, at the horizon the sun appears to be 34 minutes of arc higher in the sky than its computed position would indicate. This value of the refraction is adopted in conventional calculations of sunrise and other similar phenomena.

However, this is only a statistical value. In some instances refraction at and near the horizon may be quite anomalous and unpredictable. Its effect may be greater or smaller than the adopted value. If it is greater, sunrise will occur sooner than the predicted time. If it is smaller, on the contrary, sunrise will occur later.

In particular, for places above the Arctic Circle, the predicted occurrence of a very short day (only a few minutes in length) may depend only on the effect of refraction. If this effect is smaller than anticipated, the upper edge of the sun will not reach the horizon at all and the sun will not rise that day, the almanac to the contrary notwithstanding.

The definition of sunrise refers to the upper edge of the sun rather than to its center, for an obvious reason: As soon as any part of the sun is visible, daylight is present. However, the positions of celestial bodies—including the sun—given by Newtonian theory, refer strictly to their center. If these positions were used without modification in the predictions, the computed time of sunrise would be too late by a few minutes. Therefore, allowance is made for this effect in the calculations.

If the times of sunrise and sunset at the equinoxes were computed for the center of the sun and without regard to refraction, the length of the day would be exactly equal to twelve hours as the Latin name implies. Only in the geometric sense is it truly an "equinox." The effect of refraction, which raises the sun above the horizon both at sunrise and at sunset, and the fact that the upper edge of the sun reaches the horizon *before* the sun's center at sunrise, and *after* the sun's center at sunset, combine to increase the length of the day by about seven minutes.

The reason for the delayed sunrise after the winter solstice is a more complex one. The time kept by our clocks and by which we live is based on an average motion of the sun. It would be the same as apparent solar time if the sun were to move uniformly on the celestial equator. If this were the case, the sun would cross the meridian every day promptly at twelve o'clock noon. But nothing is that simple in astronomy.

First of all, the yearly motion of the earth around the sun, or, if you prefer, the apparent yearly motion of the sun eastward around the earth, takes place in an elliptical orbit according to Kepler's laws of motion. The third of these laws tells us that the line joining the centers of the earth and of the sun sweeps equal areas in equal times. Therefore, when the earth is closest to the sun—some time in early January—the earth must move faster to compensate for the fact that its distance to the sun is shorter. Thus, around that time, the sun appears every day a little more to the east of the meridian than if its motion were uniform. And since it must cross the meridian from east to west, it will cross it *a little later* every day for a while.

This day-to-day retardation of the time of apparent noon delays similarly the times of sunrise and sunset. Consequently, although the overall length of the day increases after the winter solstice, the sun continues to rise later every day until about the middle of the month of January.

This effect of retardation is still increased somewhat by the inclination of the earth's orbit with respect to the celestial equator. If you have access to a terrestrial globe on which the ecliptic (yearly path of the sun) is shown, you will notice that at the solstice, the motion of the sun is more nearly west-east, in comparison, for example, with its motion at the autumn equinox when it is partly north-south. Thus, here again is another reason why the eastward motion of the sun is more rapid in the vicinity of the winter solstice, and why the sun's consecutive crossings of the meridian are progressively delayed.

VISIT TO A PLANET

That I shan't live to visit another planet
Can't matter too much, can it,
To a mind still wonder-stricken by this sphere? . . .
Astounded equally
By tiger and tiger lily, snowflake and sea;
Growing more dazzled year on precious year
By cricket and chipmunk, mountain and lace-veined pebble,
The flight of a bird, the spider's silken cable,
By the acorn that can give an oak tree birth.
What marvel has Mars to offer that is worth
One hour of this visit to earth!

Georgie Starbuck Galbraith

In the month of March, the moon will be full on March 5, and the New Moon will occur on March 20.

The vernal equinox, or beginning of spring for the northern hemisphere, will occur on March 20, at 10:06 P.M., Eastern Standard Time.

Mercury will be favorable for observation as an evening star in the latter part of March. By the end of that month, it will set in the west one and one-half hours after sunset. It will be brilliant, attaining magnitude –1.3 on March 15, –0.2 on March 27. On March 21, it will briefly be occulted by the moon for observers in parts of North and Central America. The exact time of the phenomenon depends on the location of the observer.

Venus, in the morning sky, will reach its greatest brilliancy (magnitude –4.3) on March 4. It will rise about 2 hours before the sun throughout the month of March. Located in Capricornus, it should be easily found owing to its great brightness.

Mars will precede Venus by approximately one-half-hour in the same general region (*continued on page 163*)

Nature IN THE SCHOOL

By E. LAURENCE PALMER

Professor Emeritus of Nature and Science Education, Cornell University, and Director of Nature Education, The American Nature Association

Bailey Day for Schools

IT WOULD BE EMINENTLY APPROPRIATE if schools throughout the world chose to celebrate March fifteenth as Liberty Hyde Bailey Day. This statement is not made idly, or because I happened to know and to admire the man who was born March 15, 1858, and who, for nearly a century, contributed as much if not more than any of his contemporaries to the wholesome advancement of botany and horticulture, of rural education, sociology and economics. Few men have contributed more, in a ninety-six-year lifetime, than did he. Few individuals, if any, made their influence significant to a wider segment of our population, whether the most profound technician or the humble person who wrested a living from the soil by methods possibly as old as civilization itself.

Schools wishing to honor this man, who wrote with equal effectiveness for children and for advanced intellectuals, may find in the special insert in this magazine suggestions that may be useful in such observance. Eighteen plants have been selected as representative of the fields of interest and accomplishment of L. H. Bailey. The story of each plant, and of its significance in a Bailey memorial, have been given so that any teacher may with little effort put on an exhibit or a program that will help honor the man on his hundredth birthday, or near that date.

The "ides of March"

We often hear the expression "Beware the ides of March." This happens to be the 15th day of March, and was supposed to be the day on which it was predicted Julius Caesar would be murdered. Because of this it was considered an inauspicious day and a poor day to "start something." Teachers wishing to show how ridiculous such superstitions may be may wish to call the attention of pupils to the fact that, while Caesar built an empire, it fell and many of his associates, including some whom he considered friends, took part in his murder—or, if you prefer, his assassination. Superstitious folk might do well to learn of Liberty Hyde Bailey, who was born on one of the most superstitiously dreaded days of the year, who lived a notably constructive life, outlived most of his generation and whose death was mourned by all who knew him, or knew of his work. There was no Brutus for L. H. Bailey.

It was hoped by many that Dr. Bailey might some time write his autobiography, but he felt he had many more important things to chronicle and could not take the time to write about himself. It is said that he once took the time to write a novel, but apparently no one ever read it except himself. The story goes that the novel ended its days, page by page, in the fireplace of his country home near Ithaca. His verses were often written on scraps of paper as he was riding from one place to another. Fortunately many of these were saved. A glimpse of a dilapidated buggy in a barn yard, seen as a train whizzed by, aroused a line of thought concerning what that buggy might have known in better days. Why not put it into verse? If a talk had to be given to a group of metropolitan "farmers" who did their farm work from an office chair, why not talk about something these gentlemen probably had experienced only slightly? The result was a verse on "Mud." When it was finally decided that New York State should have its State agricultural college at Cornell University, the "Puckish" nature of L. H. Bailey stepped forward. The result was a picture in Bailey's office of Chancellor Day of Syracuse University, who had done everything possible to get the college for his university. Under Dr. Day's picture in Bailey's office appeared the legend "The Founder of the State College of Agriculture at Cornell University." Dr. Day had antagonized enough neutral legislators to win the victory for Liberty Hyde Bailey and for Cornell. In the minds of many it is unfortunate the botanist could not see his way clear to continue at the helm at Cornell, but he had other plans. Teachers, and others interested in this side of Liberty Hyde Bailey, would do well to read Philip Dorf's *Liberty Hyde Bailey, An Informal Biography*.

Worked with Roosevelt

L. H. Bailey was only a half-year older than Theodore Roosevelt, and the two men worked in harmony during many years for the betterment of rural folk. Roosevelt wrote, relative to his famous Commission on Country Life: "I doubt if I should have undertaken to appoint the commission if I had not been able to get Director Bailey for its head, and no man in our country did better work for the country than did he on that Commission." It was on the findings of this Commission that we eventually had our parcel post system, our national extension service, our agricultural and home-making education, and our rural electrification.

Since schools and others will this year be celebrating the hundredth anniversary of the birth of Theodore Roosevelt, it might be well to recognize, at the same time, the hundredth anniversary year of Bailey. It is possible that if the emphasis given here to Dr. Bailey proves of value to teachers we may prepare a similar unit on Theodore Roosevelt for the August-September issue of *Nature Magazine*, building our story around the interest T.R. had in animals, as we have built this one around the interest L. H. Bailey had in plants. What do you think of the idea?

It might be worth while for school activities to have some children make a survey of the literature listed in the school or local library of which Dr. Bailey was the author or the editor. In all probability there is more such material there than you may offhand suspect.

Many folk are interested in making stamp collections. Where this is the case it may be worth while to be sure to get one of the garden and horticultural commemorative stamps that will be issued on Liberty Hyde Bailey's birthday, March the fifteenth. First day stamps postmarked on the day being memorialized are always considered of more value to collectors than those that are issued later. Keep this in mind.

Summer Job Openings

Hundreds of summer jobs will be open this year for science teachers, college girls and graduate students who like the relaxed, informal atmosphere of the out-of-doors, in the capacity of Nature consultants at camps operated by 650 Girl Scout councils throughout the country. To qualify as a Nature consultant, a woman must be at least 21 years old, have the required specialized knowledge (based on formal training in the natural sciences, or informal personal interest in Nature study and the out-of-doors), and enjoy working with young people. Salaries are determined by the individual's experience, qualifications and training, and a basic pre-camp training session of about five days is provided all staff members. For information about these country-wide summer job openings, write to Miss Fanchon Hamilton, Recruitment and Referral Advisor, Girl Scouts of America, 830 Third Avenue, New York City 22, New York.

Island

(Continued from page 149)

Alvord's conservation classes never exceed twenty-four members, since more would be apt to trample the natural areas visited, and individual attention would become difficult. This last is one aspect strongly stressed by Alvord's expert teaching staff of four—Lester Giles, "Cap'n Bill" Vinal, William E. Randall, Jr., and Robert Frey. Alvord is no "diploma mill."

The school year begins in June, and ends about Labor Day. Classes are held from 9:00 until 11:00 a.m., and 2:00 to 4:00 p.m., with occasional evening programs.

The emphasis is by far on field work, with book study introduced only in special cases. All students live in snug cabins right on the Sanctuary grounds during their two-week stay. Dining and recreational facilities are complete.

Les urges anyone interested in the school to write for its free brochure, c/o The Director, Alvord Wildlife Sanctuary, 180 Longwood Avenue, Boston 15, Massachusetts. The fee for each two-week course is $105.00, and includes room, board, tuition, registration fee, recreation. . .*plus* health insurance!

As Les and I walked slowly down to the dock, where the faithful sea skiff rocked placidly at her mooring, we paused a moment to gaze out at the glorious sunset reflected on the wind-wimpled face of the lake. Then we turned and drank in the tall, proud forest's silent splendor.

"Yes," I found myself murmuring, half-aloud, "this is surely a place where they can learn—learn of the will that everything alive has to live, and at the same time, learn with proper humility our own inability yet to realize fully the importance of every living thing in the complex inter-relatedness of life."

Then the big inboard engine spluttered and caught, and wonderful Bear Island slowly faded into the widening V of our wake. ⚘ ⚘ ⚘

Bulletin

"Project Coral Fish Looks at Palau," by Frederick M. Bayer and Robert R. Harry-Rofen, is publication 4287 of the Smithsonian Institution, Washington 25, D. C., telling the fascinating story of undersea exploration in the American Trust Territory of the Pacific Islands, sponsored by a number of research and scientific organizations. Highly readable, and illustrated with twenty black and white plates.

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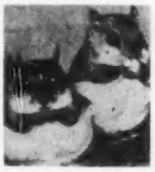

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THE Nature CAMERA

By EDNA HOFFMAN EVANS

Applying Old Axioms

"EVERYBODY IS SMARTER THAN ANYBODY." The old saying sounds rather confusing, until you take it apart and analyze it. In essence, it says about the same thing as another old axiom: "Two heads are better than one." Thus, no one person can know as much as is represented by the combined knowledge of everybody. The direct antithesis, as expressed in another old adage, is "Too many cooks spoil the broth." Then back we can go again to the other side, with "Many hands make light work."

This can go on indefinitely, and we could quote old sayings and pithy maxims to the point of nausea. But when all the quoting is over, what we have is nothing but some rather trite cliches and generalizations that are meaningless, until they are applied to specific instances.

I have in mind the application of the old sayings to camera clubs. I was steered into this course of thought by a recent letter from a reader, asking about salons and competitions available to the ordinary everyday camera hobbyist. Apparently, the reader thought such things were open only to top flight experts and professional photographers.

Time was, when I thought the same thing. But I have learned otherwise, and perhaps the information may be worth passing along to others. To some readers, of course, the information will not be new. For others, I hope it will open up greater vistas of camera activity and enjoyment.

Photography is, in some ways, like writing; it is a solitary occupation. It must be, of necessity. On the other hand, no one person possibly could originate all the ideas and approaches to the art of picture taking that are now extant. It is in a case like this that "Everybody is smarter than anybody."

Reasons for club

After the picture is made, after the slide is developed, someone should look at it. Not just the original photographer, but other people—the more the better—who also are interested. Thus, by collecting people with a mutual interest, by pooling their knowledge, their tastes, their abilities and creativeness, more and more ideas are generated, and each individual benefits from his contact with others. That is the reason for a camera club.

Like any other organization, a camera club is only as active and as worthwhile as the individuals who comprise its membership. Some clubs, sparked by active and interested members, are productive and stimulating. Others are tight little cliques, or mutual admiration societies that rarely permit newcomers to share in anything but outer-fringe activities. Still others are old and weary, much in need of new blood to revive and rejuvenate them.

I am talking about clubs for adults. Many schools have teen-age camera clubs, and some of these are active and productive. When this is the case, it is usually because there is an interested adult somewhere in the background, to keep the wheels moving and the shutters clicking. There are some vitally interested youthful camera fans, but I will hazard the guess that active photo-hobbyists in their fifties, sixties, and even seventies far outnumber the fans under twenty. There are numerous obvious reasons why this should be so.

Camera club organization is far from simple. I know, for I have sat on the sidelines and watched one grow. Somebody—or better, several somebodies—must be so interested that they literally eat, sleep, and breathe camera club. By-laws must be drawn up, competitions created, methods of procedure determined, a bulletin prepared at regular intervals, field trips planned, meeting times and places set, programs arranged for, workshop activities stimulated, membership encouraged, and so on.

Pictures like this result from camera club field trips. The group arranged to visit a Western movie set one Sunday, when the cameras were not rolling. The caretaker—who looked the part as much as any actor—allowed us to roam at will through the frontier camp, and then posed for us beside one of the wagons.

The details

There are countless little details that must be looked into. Letterheads are needed, award ribbons must be obtained, an efficient method of displaying prints and slides must be worked out. Money must be raised, and disbursed—making necessary a treasurer and treasurer's reports. A secretary must keep the

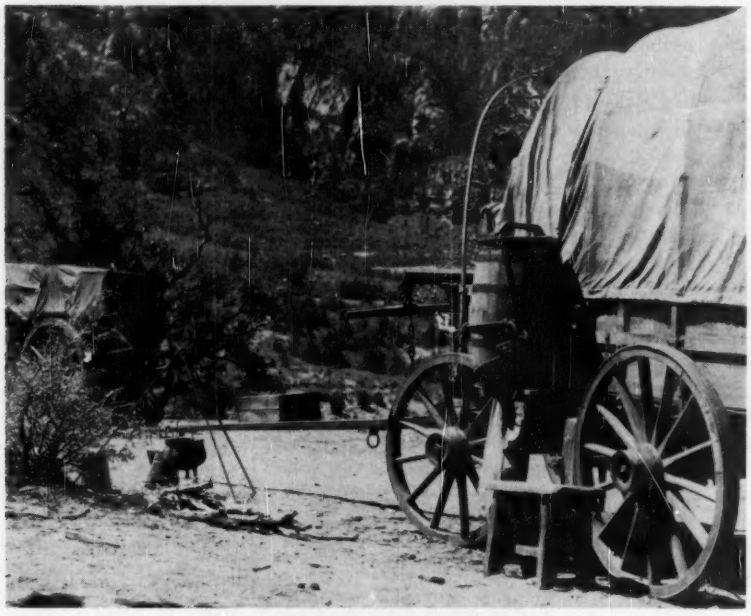
records and minutes; there is correspondence to be written. It is surprising how much framework is necessary before a group of kindred souls can successfully, regularly, and efficiently meet to share interests and exchange ideas.

One camera club permits a small group of individuals to meet, share, and exchange ideas. But how to get the ideas of a club in California to another, across the country in Maine, or how to enable a group in Florida to benefit from the activities of a group in Oregon? An affiliation of camera clubs, like an affiliation of individuals, is the obvious answer. That is the reason the Photographic Society of America has come to play such an important role in amateur photographic activities.

The PSA is not a newcomer in the field. It first began as the Associated Camera Clubs of America, in 1919. From an association of clubs, it was expanded to include individual memberships, and was given its present name in 1934. Three years later, in May of 1937, PSA was incorporated as a non-profit "medium for cooperative action in promoting the arts and sciences of photography and for furthering public education therein."

Headquarters of PSA are located at 2005 Walnut Street, Philadelphia 3, Pennsylvania. From that central location radiates a vast network of activities, reaching into each of the forty-eight States, to Alaska, Hawaii, the District of Columbia, the Canal Zone, and to Canada, Mexico, and other countries in the Western Hemisphere, as well as to countries in Europe, Africa, Asia, to Australia, Iceland, and even the Island of Yap. Only names from Russia are conspicuous by their absence from the latest membership directory.

Many camera clubs are affiliated with PSA, and through this organizational membership individual club members may take part in numerous activities and photographic opportunities open to them. Individual PSA membership entitles a person to even more services and activities. Individual "active" membership dues are $10 per year; so are organizational memberships.



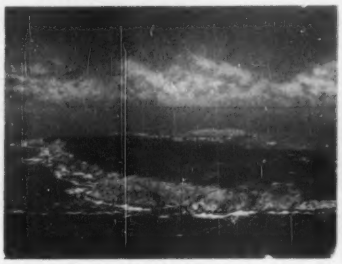
Even Hollywood returns to Nature for realistic outdoor settings, as was the case with this "location" set in Arizona's Oak Creek Canyon. The youngster in the driver's seat is not a member of the cast. The daughter of a camera club member, she enjoyed playing pioneer, while her elders took pictures.

Special divisions

In addition to the general PSA, there are special divisions designed to fit individual tastes and preferences. These include: color, motion picture, Nature, photo-journalism, pictorial, stereo, and techniques. The $10 fee entitles the member to affiliation with one of these divisions, and additional affiliation is available for $1.00 per division.

Each division has its own activities, that may include a specialized publication, competitions, traveling shows, and critique services for both

Island in Time



Ten miles from the mainland's clocks, schedules, appointments and deadlines lies Monhegan, an Island in Time, where the days are measured by sun and tide. The Inn welcomes guests who enjoy tidal pools, land and sea birds, unusually varied flora—guests who appreciate the inner peace of quiet forests, shores compass'd by the voiceful sea, the stars for streetlights. Advance reservations necessary. June 20-September 8. Illustrated booklet. The Farrells, The Island Inn, Monhegan Island, Maine.

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individual and organizational members. Each member also receives the *PSA Journal*, a monthly magazine devoted exclusively to photographic affairs.

As each camera club grows in activity and importance, it strives to sponsor some sort of competition or salon. PSA rules govern the majority (and most dependable) of these. In entering, the would-be contestant can be sure that his work will be judged, accepted or rejected, and awarded according to its merits, as determined by a group of reputable judges.

For people who like to set goals for themselves, such competitions serve a special purpose. PSA has a system of individual "star" ratings, to be gained through salon participation. In order to win a single star rating in the pictorial color division, a photographer must accumulate thirty salon acceptances of at least six slides; two-star rating requires eighty acceptances of at least sixteen slides; and three-star rating requires 160 acceptances of at least thirty-two slides. There is no time limit set, but, as one can readily see, the accumulation of stars takes a considerable amount of time, skill, and perseverance.

Nature slides

Star ratings for Nature slides do not require such high totals; but, on the other hand, there are not as many Nature salons in which stars can be accumulated. In the Nature category, one-star rating comes with eighteen acceptances of at least six slides; two-star rating with thirty-six acceptances of at least twelve slides; and three-star rating with seventy-two acceptances of at least twenty-four slides.

The PSA recognizes outstanding talents and contributions to all fields of photography by means of an honors committee. These awards are indicated by the collections of initials sometimes found after a photographer's name. The letters APSA means the individual has been awarded an associateship; FPSA, a fellowship; Hon. PSA, honorary membership, and Hon. FPSA, honorary fellowship. According to the by-laws, the number of living Honorary Fellows shall not exceed twenty-five at any time.

Of course, not every member—individual or club—takes equal advantage of all the opportunities offered. But each benefits in accordance with the amount and enthusiasm of his participation. I am frequently amazed at the zeal that fires people, when it comes to things photographic. For no monetary gain at all—merely for the satisfaction derived and the honor attendant thereto—they keep slides and print entries going out and back, competing and circulating, just because they are interested.

I, personally, feel that I have benefitted considerably from both local club membership and PSA affiliation. In neither have I participated to the fullest, but I have benefitted, nevertheless. I have learned a great deal, both about big photographic principles and minute photographic techniques. On the basis of my own experience with a young and active camera club, I can sincerely recommend camera club or PSA membership, or both, to anyone else who likes photography.

Some advantages

In addition to learning opportunities and making pleasant contacts, the club affiliation makes possible an entry into certain places closed to the ordinary individual. The club makes arrangements for field trips to places at the proper time—somebody is bound to know when the Joshua trees are in bloom, or where the best spring flowers or brightest fall colors can be found. Or somebody has located a movie set, or cornered a model, or discovered a particular scene that makes good camera material. A lumber company often will provide a special train through the forest for a camera club, a mine will delegate special guides, a museum will make available its facilities, a caretaker will "open up" for a group where he would not for an individual.

I am not one to feel completely at ease in a crowd. Nothing makes me more irritable than to have someone stick a head or an elbow in front of my lens at a crucial time. I would rather go somewhere in an "off" season rather than at rush hour. However, when it comes to the pooling of resources and know-how that results from camera club association and PSA membership, I am quite willing to admit that in this instance, at least, it is quite true that "Everybody knows more than anybody"—especially when that anybody happens to be me.

Conservation Stamp

Postmaster General Summerfield has announced an addition to the conservation stamp series this year, a multi-colored production featuring a theme of "Keep America Green." Smokey Bear, forest fire prevention symbol, has been mentioned as a possible motif for the stamp.

Sulphur

(*Continued from page 131*)

around the neck, from killing frost until daffodil-time, supposedly immunized the wearer to spring complaints. Winter impurities also were removed from the body by sweating. "The spring is moist, of temper good and warm, then best it is to bathe, to sweate and purge," advises an early medicine guide.

The ancient custom of washing in brook water on Easter morning has survived in parts of Europe, and Easter legend has it that all running water is blessed with life-giving powers on the Day of the Resurrection. Katydids, sounding on humid August nights, warned housewives that leaves for spring teas must be gathered before the frost, and herbs picked in August were thought to harbor special healing powers. The medieval church incorporated this belief into the blessing of herbs, widely practiced on Assumption Day.

There was a variation in the methods of drying herb leaves. Some were shade- or sun-dried, others were immersed in boiling water, and then dried at slow heat. Uprooting and suspending the entire plant in bunches was the simplest process. Sweet fern, bergamot, boneset, yarrow, tansy, and catnip, drying beneath the attic rafters, perpetuated fragrant memories of summer. Dire punishments were meted out to culprits apprehended in a quest for sweet fern, to fill homemade corncobs. The roots of the wild ginger had to be dug before the velvety heart-shaped leaves died down, and the aromatic roots were kept on hand for snakebite, and for post-winter tune-ups.

After the confinement of winter, the tonic jug was as welcome as the first hepaticas. In common with that Saturday soaping, when winter underwoolens were discarded, the annual dosing was inevitable. The flavor of sassafras and wintergreen lingers on, but the wealth of roots and herbs that comprised the spring pharmacopoeia are memories, now, of sulphur and molasses time.

Grass

(*Continued from page 136*)

contributed handsomely to the expanding southern cattle industry. The current Rosen accomplishment, now fourteen years along, is a super-yield winter forage wheat that promises eight tons or more of winter grazing to the acre, plus good seed yields, one of the fixed requirements of grass improvement.

Since funguses are now the most serious enemies of grass, fungus fighting becomes another story in the book of grass adventure. Dr. H. E. Wheeler, of Louisiana State University, is a pioneer in developing the "mass protective technique" in the selective breeding of disease-resistant varieties. For example, he seeks to combat the common oat "rust," *Helminthosporium victoria*, by sprouting oats in hundred-bushel quantities—about 45 million seeds—dousing the seedlings with a secretion from the fungoid blight, and then treating the survivors with a toxin developed from the organisms of the principal disease fungus. About one seedling in 100,000 survives both treatments, but, from the few survivors, the Louisiana pathologist seeks to develop resistant strains and a fundamental technique for developing the resistance of grass to many other disease enemies.

Many comparatively new technical factors are being introduced into the work with new grasses. These include seed immunization and pre-treatment with favorable mycins; techniques for excising immature seed to save ripening and hardening time; greenhouses designed to speed up experimentations, and vegetative hormones, vitamins, and nutritive stimulants, as well as many other metabolic factors. But the prime elements of grass adventure still remain quite largely within the grasp of everyday people—farmers, gardeners, students, and even office and home workers—who are curious enough to investigate for themselves.

Hundreds of examples might be cited, but here are a couple. Don Antonio Rameriz, a Guatemalan dirt farmer, set out single-handedly, a third of a century ago, to hunt down the lost wealth of the essential oil grasses, including citronella, lemon grass, and vetiver. He found all of them in small Caribbean islands, propagated them by hand on his farm in Guatemala, and has provided much of Central America with a renewed industry of valuable oils distilled from them.

Three years ago, Marine Private Ollie Whitaker spent his two-week's leave in Japan assembling and forwarding to the United States Department of Agriculture an outstanding collection of Japanese grasses, some twenty of which are now showing promise in experimental plots in five States. Marine Whitaker was nineteen at the time of his explorations, and a "veteran" of a one-term high school course in botany.

But, now that I think of it, Timothy Hanson never went to school at all—he just "pikked up larnin' " from his preacher-father. Grass provides its own school, and opportunity for adventure that extends from doorways and window boxes to beyond the far horizon. Near and far, grass teaches people even while it sustains them.

Sunrise

(*Continued from page 157*)

of the sky (Sagittarius-Capricornus), but will be much less conspicuous. It will remain low in the southeastern sky until sunrise.

Jupiter will rise at about 9 P.M. on March 15, 8 P.M. by March 30, and will remain visible for the rest of the night. It will be bright (magnitude –1.9) and will be found in Virgo to the east of Spica.

Saturn, in Ophiuchus, will rise in the southeast at about 2 A.M. on March 1, 1 A.M. on March 15, and around midnight by the end of March. It will be low in the southern sky by dawn.

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Frog Hunting

(*Continued from page 155*)

"Oh, you never can tell *what* we may catch!" they said.

How right they were! This was a hunt where nobody came back empty handed, except for one youngster who managed to fall in backwards, and his mother who had to make a round trip home with him to get dry clothes. For those not quick-sighted or quick-handed enough to catch a peeper, there was exuberant satisfaction in bringing home huge blobs of frogs' eggs, a fresh batch of polywogs, or some of the larger frogs. Total catch was three mammoth toads, one dark brown, medium-sized frog with a bright green stripe, and four peepers. Time consumed, thirty minutes. It was the highest individual catch in the entire neighborhood for the season—eight peepers.

Some interesting facts came to light in the swamp, as well as some interesting specimens of night wild life. Women were proved not necessarily the ones who are reluctant to pick up frogs. A couple of boys and girls, supposedly at the dare-and-do age, made quite a fuss about groaning, "Oh, he got away," when they muffed their first couple of chances to grab something. Once they found that a frog's skin is simply cool, smooth, skin-feeling skin, they no longer missed their prey. Also, one husband and father was observed to have a complete aversion to plunging a hand into the murky water after any moving object, because it very well might be a snake. He did not noticeably overcome this reluctance during the course of the hunt. In fact, he showed no desire to overcome it.

All our frogs behaved admirably when we brought them into the house. We gave up trying to make an accurate identification of any but the peepers, when we had all taken turns at the guidebook and found that there are some ninety-nine varieties of frogs and toads. The peepers obliged us by turning from brown to pale green and to purple, when placed on sheets of colored paper. They sang, and not only the peepers, but the toads as well. To our great surprise, from the throats of these rough-looking specimens issued the soft, melodious trill that sounds from the trees on warm summer nights. Furthermore, in spite of their forbidding appearance, the frogs turned out to be nothing but old softies, at heart. When we scratched one behind the ear, it sat up and leaned back for more, gratefully as a kitten.

Obviously, it was true that frogs would make nice pets; but we abandoned our plans for making a moss-garden home for them in an aquarium, when we contemplated the job of supplying them with food. We learned all about *that* last summer, when our boys kept their favorite snakes in cages. No, we had had our fun, and decided to keep it all fun and no work. We opened the jars and bid all our frogs a friendly farewell, the next day.

Being inherently generous people, for all our pride in our proficiency at peeper hunting, we are willing to impart the following learned-by-experience techniques to any who, when next they hear the chirp of a peeper, are overcome by a yearning to see it.

Walk as silently as possible to the spot from whence the singing comes. The singing will promptly stop, but it will begin again in a few moments, if you stand still and wait.

Shine your flashlight beam along the *edges* of the water. The frog will be sitting on the moss between the stalks of grass, or will be half-in and half-out of the water.

Remember that three-quarters of an inch is very small, and the frog will be the same color as whatever it is sitting on. The best thing to do is to keep still until you see something move.

When you see the frog, grab with your whole hand, moss and all. Even though it appears fragile and dainty, a light-fingered approach loses the frog every time.

Put the frog in your jar, screw on the lid, and go home to a peaceful night's sleep. As to equipment, the only indispensable item, in addition to rubber boots, a jar with holes in the lid, and a flashlight, is a nose not easily offended by prolonged suspension an inch above swamp-water!

Bull Moose

(*Continued from page 124*)

forced to maintain the great progress that has been made; to protect national parks and wildlife refuges against special pressures; to give status to the federally owned, unspoiled wilderness area. This is the intent of the bill to "establish a National Wilderness Preservation System for the permanent good of the entire populace." Once opened up, there would never be a return to the natural condition of these areas.

This year, it is appropriate to think back to the words of Theodore Roosevelt, especially those he uttered at the Grand Canyon, in Arizona: "I want to ask you to do one thing in connection with it in your own interest and in the interest of the country—to keep this great wonder of nature as it is. I hope you will not have a building of any kind, not a summer cottage, a hotel, or anything else, to mar the wonderful grandeur, the sublimity, the great loneliness and beauty of the Canyon. You can not improve it. The ages have been at work on it, and man can only mar it."

Today, one might easily apply this advice to all our remaining wilderness areas. It should be our duty to preserve them, as Theodore Roosevelt would say, "for the people unborn."

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Nature AND THE MICROSCOPE

By JULIAN D. CORRINGTON

Science Shops—11

Ward's Natural Science Establishment, 5.

OWNERSHIP OF the Establishment was transferred to the University of Rochester in 1928. There was a provision in the deed that all of the accounts receivable that were collectible were to go to the Ward family, and this, of course, meant that the only liquid assets possessed by the ailing company were drained off, leaving only a stock that consisted mainly of obsolete specimens and equipment. Now at last the University came handsomely to the rescue, with a loan of $45,000 for new working capital. And now at this juncture it seemed that the shade of Professor Ward still maintained a guiding hand upon the destinies of his institution, for instead of using this fund for modernization of the entire firm, the whole sum was turned over to the head of the chief department, George Letchworth English, mineralogist, who left at once on a world collecting tour for the purchase of mineral specimens, in the best tradition of old.

English was a polished and ingratiating gentleman who was said, at the time, to be the world's foremost authority on commercial mineralogy. He was a member of societies everywhere and, in 1927, served as vice-president of the Mineralogical Society of America. In 1904, he was associate editor for his subject for the Encyclopedia Americana, wrote a comprehensive catalog of minerals, and much later a very fine *Getting Acquainted With Minerals*. But he shared the common Ward failing of pricing his specimens too low to show a profit. Before he returned from this global junket, he had spent the $45,000, and $15,000 more, which, somehow, the firm managed to scrape together.

The third fire

Now occurred the worst calamity ever to befall this institution, with its storied and glamor-laden history, a third and most devastating fire that all but wiped out the College Avenue plant.

On the night of September 30, 1930, a fire started in the furnace room and had several hours headway before it was discovered, spreading throughout the main building. After a stiff fight of three hours, the firemen had the blaze under control, but it was a scene of utter desolation that greeted the arrival of the staff. Priceless material was gone forever; 15 orang skeletons, the last of a collection made by Hornaday in the 80's, 12 chimpanzee, 6 gorilla, 20 echidna, 3 passenger pigeon, 2 Carolina parakeet, and some 200 other skeletons, including many rare Australian species — all destroyed overnight. A fine group of three mounted elk had dominated the center of the main exhibition hall, but now all that remained were the charred manikins, with large glass eyes staring out over the heart-rending waste of broken glass, drenched birds, and blackened skeletons.

In the biological preparations room several barrels of formalin had let go, showering their contents far and wide. In the casting room, the original for a large relief map of Vermont was so soaked and warped that it was useless; six months research and construction gone to glory. Drawer after drawer of rocks, minerals, and fossils were coated as if with shellac; bird and mammal skins were under water. The sole department that escaped was Entomology, whose huge collections were stored in a separate building that was spared.

It so happened that the Men's College of the University had moved to their fine new River campus, and the Women's College had not yet taken possession of the vacated buildings. The University authorities now again came to the rescue of poor old Ward's, and offered the use of the men's gymnasium, as well as the concert hall of the School of Music. In the gymnasium, rough cases were built, and to them was transferred all stock that could be salvaged. The main room housed the minerals, the basement the molds and casts, the running track the biologicals, piled in hopeless confusion—starfishes, skeletons, sponges, corals, mammal skins! On the stage of the auditorium of the School of Music were skeletons and fossils; in the rear was the temporary shipping room. A dormitory basement was used for relief map work, while the books and papers of the Establishment were taken to the basement of the library.

The Establishment survives

Insurance on Ward's stock was for $50,000, which was paid in full. For a time the University, very understandably, considered closing the company. They had their $45,000 loan back, and $5,000 in addition, so why not get rid of the white elephant, now so badly smudged? But Hawley Ward and English were not going to take this lying down. They wrote a large number of letters to the many friends and patrons of the Establishment, urging them to write to the University and to plead the cause of this old and valuable institution. So impressive was the response that the board of trustees, with considerable reluctance, decided to give Ward's one more chance; but they stipulated emphatically that someone was to be hired as a business manager who could reorganize the firm and operate it on a commercial basis. They offered to return the insurance money to provide working capital.

The proposition was accepted, the money became available at once, and the staff set to work with renewed zest to get the Establishment back into the sales picture. Such was the situation when, in June, 1931, President Rush Rhees of the University engaged Dr. Dean L. Gamble to come to Rochester as President of Ward's, Mr. Hawley Ward becoming chairman of the board of directors. Thus, at long last, some outside blood was brought into the management of the organization, and we shall see the effect of this important move in our next installment.

Beginner's Primer

THE Clistogastra, that suborder of the Hymenoptera that includes much the larger number and all of the better known species, is characterized by the "wasp-waist" of the adults and legless condition

of the larvae. What appears to be the first segment of the abdomen in these insects is actually the second, the first one being fused with the thorax; the second segment is slender and termed the petiole or pedicel.

Besides the familiar ants, wasps, and bees, this suborder contains an immense number of forms classified into some 134 families, the vast majority of which are never seen by the average person, or even by the student of zoology. Mostly they are of great economic benefit to human interests and within the group illustrations may be found of many important biological principles —predation, commensalism, parasitism and hyperparasitism, alternation of generations, parthenogenesis, polyembryony, and others. Specialists in hymenopteran lore become fascinated by the intricate and ingenious instincts and modes of life that so many of these species display and many an entomologist has devoted a lifetime of research to a single group.

Ichneumon flies

Those families placed lower in the scheme of classification than the ants are, in general, lumped together as the *parasitic hymenoptera*, and the first of these to claim our attention will be the Ichneumon Flies (Ichneumonidae), although the term ichneumon wasp would be more appropriate. These range from minute (2-4 mm) to medium (10-30 mm) in size and include some giants, up to 100 mm and over. They parasitize many orders of insects, chiefly beetles, lepidoptera, flies, and other hymenopters. In most cases the female may be known by a long ovipositor, which protrudes from the ventral side of the abdomen some little way back from the tip. The body is elongate and slender, the antennae filiform and long, with many segments. There are three ocelli in a triangle on top of the head, the wings are large and the legs long and slender; the abdomen is also long and is either cylindrical or compressed, from two to three times the length of the rest of the insect. The family is cosmopolitan and a large one, with something like ten thousand species.

Perhaps you have witnessed the performance of *Megarhyssa lunator*, formerly called *Thalessa lunator*. This is a gigantic (as sizes go in the Hymenoptera) elongate wasp-like type with correspondingly long legs and antennae and an extremely long ovipositor. In use, this instrument is looped over the back and planted vertically against the bark of a tree where indications point to the presence of a burrow of the larva of the Pigeon Tremex, *Tremex columba*. Now the female *Megarhyssa* proceeds to drill through the bark until the *Tremex* burrow is reached, whereupon she deposits an egg. Upon hatching, the *Megarhyssa* larva crawls along the burrow until it finds the *Tremex* larva, upon which it feeds, sucking the blood. The ichneumon transforms to the pupal stage, and the adult, upon emergence, must gnaw its way free.

Wasp-like insects

The commoner ichneumons of medium size belong to the genus *Ophion*. They may be recognized as yellowish to brownish wasp-like insects, in the neighborhood of an inch in length, with a curved abdomen, arched upward, and at the same time very much flattened from side to side. One species parasitizes the Polyphemus moth, laying a single egg in the caterpillar, which lives long enough to spin its cocoon, but not to become a pupa. Comstock says that the *Ophion* larva, when full grown, spins a dense brownish cocoon within the cocoon of the moth, from which it later emerges.

The smaller ichneumons make excellent whole mounts for slides, and the many parts of the larger species will likewise add interesting mounts for the insect slide collection.

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On the stage carrier, located halfway down on the massive arm, are two matched stages, one beneath each objective. Each stage is adjustable along three dimensions—east-west, north-south, and up and down, and is equipped with a chuck to hold a bullet in any position. Items other than bullets may also be examined and compared.

From each stage an arm projects laterally and supports a vertical standard on which the illuminants are carried. In rear is seen the transformer and controls for the two identical lamps. The wheel at the top of the pillar acts as a coarse adjustment in focusing, while precise final focusing is done by raising or lowering each stage separately until the paired images in the single eyepiece or upon the camera ground glass are sharp and clear.

The new Leitz comparison microscope is being used in scientific criminal-detection work.

The left half of an image of a bullet (for illustration) removed from the body of a homicide victim, is now placed in continuity with the right half-image of a second bullet, fired from a suspect's gun. If the two bullets are, in fact, from the same gun, the rifling scratches of the two can be matched perfectly in the composite picture presented to either the eye or the camera, but if the two bullets under examination have been fired from different pistols, their magnified images will not match. Thus the microscope plays detective and presents incontrovertible evidence, either for or against the accused.

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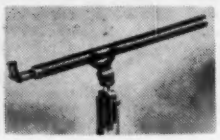

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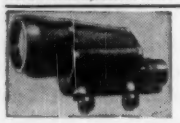

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Book Review

Humor

Collected and mounted by Professor Bernal R. Weimer, Bethany College, who is without doubt the world's most inveterate punster, is a new collation of zany exam answers, poems, songs, cartoons, and just plain low-down puns, entitled *Of Things Bi-Illogical*. This new volume is a companion to the earlier *Nature Smiles in Verse*, but departs in content from the first book, which was entirely poetry. "A little laugh is a dangerous thing," announces the title page, "take a belly full." We say, take the volume, from the non-conformist penguin, dressed in sports clothes instead of the formal evening attire customary with his tribe, on page ix, to the two snakes on page 70, whose coils are all hopelessly enmeshed, and one of them demands, "Take what belongs to you and get out."

Teachers and connoisseurs of Things Bi-Illogical must by all means add this little tome to their collection. The entries run the gamut from the terrible to the sublime, but include many choice bits that you will, if a teacher, love to read to your classes, if only as examples of what not to do, and if not a teacher, well—that is *your* hard luck.

The compiler has, for a number of years, edited a Department in BIOS, quarterly journal of Beta Beta Beta, national honor fraternity in biology, and he is also, at present, serving as national president. Seven of our own song parodies, which have appeared from time to time in these columns, are included.

Pp. ix, 70; 21 figures, 1957. Order from B. R. Weimer, Bethany, W. Va., $2.25 postpaid.

POSTMOR TEMQUOTES

Scott

Oh, young Lochinvar is come out of the west,
And of all on our team he was clearly the best.
As a bold quarterback he could pass like a jet
But he couldn't pass anything else on a bet.
So alas for the hopes of the budding young star,
The bowl games will see naught of young Lochinvar.

—*Lochinvar*, from *Marmion*.

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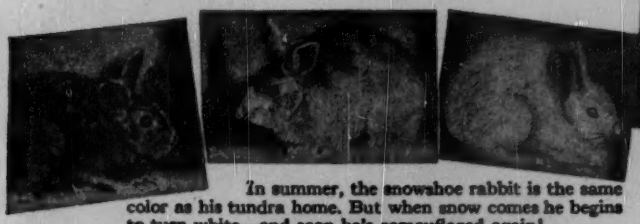

In summer, the snowshoe rabbit is the same color as his tundra home. But when snow comes he begins to turn white—and soon he's camouflaged again!

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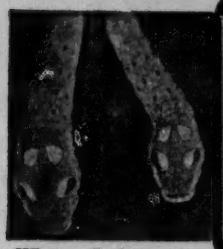

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